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November 1, 2019

Ms. Anne Weinkauf
Indiana Department of Environmental Management
State Cleanup Section
100 North Senate Avenue, Room IGCN 1101
Indianapolis, Indiana 46204

Re: Revised Remediation Work Plan
Former O'Neal's Clothes Depot Cleaners, Martinsville, Indiana
State Cleanup # 0000402
Wilcox Project #341.14

Dear Ms. Weinkauf:

Wilcox Environmental Engineering, Inc. ("Wilcox") is pleased to provide this Revised Remediation Work Plan ("RWP") on behalf of our Client, the former O'Neal's Clothes Depot Cleaners located at 833 East Morgan Street in Martinsville, Indiana (the "Site"). This Revised RWP has been prepared to incorporate recent subsurface investigation completed south and west of the Site adjacent to the sanitary sewer utility area in accordance with a request from project stakeholders, as provided in our email correspondence dated September 16, 2019. Based on the recent Site activities, Wilcox proposes to extend the soil chemical injections in this area in lieu of the previously proposed sewer repair activities.

If you have any questions or comments, please contact Jeremy Kinman at jkinman@wilcoxenv.com or (317) 472-0999.

Sincerely,
Wilcox Environmental Engineering, Inc.

Jeremy S. Kinman, LPG, PG
Associate Technical Director

R. Scott Stoldt, CPG, LPG, PG
Director

Enclosures: Revised Remediation Work Plan with Attachments

cc: Mr. John O'Neal
Mr. David L. Guevara, Ph.D., Taft Stettinius & Hollister LLP

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Revised Remediation Work Plan

Former O'Neal's Clothes Depot Cleaners
833 East Morgan Street
Martinsville, Indiana

State Cleanup # 0000402
Wilcox Project #341.14

November 1, 2019

Prepared for:

Mr. John O'Neal c/o
Mr. David L. Guevara, Ph.D.
Taft Stettinius & Hollister LLP
One Indiana Square, Suite 3500
Indianapolis, Indiana 46204-2023

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List of Acronyms

AOC	area of concern
AST	above-ground Storage Tank
BGS	below ground surface
COC	contaminants of concern
CDCSL	commercial/industrial direct contact screening level
CIASL	commercial/industrial indoor air screening level
cPAH	carcinogenic poly-aromatic hydrocarbons
CSGSL	commercial/industrial soil gas screening level
CSM	Conceptual Site Model
CSSSL	commercial/industrial sub-slab screening level
CVIGWSL	commercial/industrial vapor intrusion groundwater screening level
cVOC	chlorinated volatile organic compound
DTW	depth to water
ESL	excavation worker direct contact screening level
ERC	Environmental Restrictive Covenant
HASP	Health and Safety Plan
IDEM	Indiana Department of Environmental Management
IDW	Investigative Derived Waste
IUPPS	Indiana Underground Plant Protection Services (i.e. 811)
LUST	Leaking Underground Storage Tank
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSL	mean sea level
MTG	migration to groundwater
NFA	No Further Action
ppb	parts per billion
ppm	parts per million
PID	photo-ionization detector
PDB	polyethylene diffusion bags
RCG	Remediation Closure Guide
RDCSL	residential direct contact screening level
RGWSL	residential groundwater tap screening level
RIASL	residential indoor air screening level
RMTGSL	residential migration to groundwater screening level
RSGSL	residential soil gas screening level
RSSSL	residential sub-slab screening level
RVIGWSL	residential vapor intrusion groundwater screening level
RPG	Remediation Program Guide
RWP	Remedial Work Plan
SSDS	sub-slab depressurization system
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
µg/L	micrograms per liter
VFC	Virtual File Cabinet
VOC	volatile organic compound
BTEX	benzene, toluene, ethylbenzene, total xylenes
DCE	cis-1,2-dichloroethene
MTBE	methyl tertiary butyl ether
PCE	tetrachloroethene
TCE	trichloroethene
tDCE	trans-1,2-dichloroethene
1,1-DCA	1,1-dichloroethane
1,1,1-TCA	1,1,1-trichloroethane
VC	vinyl chloride

1.0 INTRODUCTION

Wilcox has prepared this *Revised Remediation Work Plan* ("RWP") on behalf of Mr. & Mrs. John O'Neal, the owners of the former O'Neal's Clothes Depot Cleaners located at 833 East Morgan Street, Morgan County, Martinsville, Indiana (the "Site"). The Site is being managed in the Indiana Department of Environmental Management ("IDEM") State Cleanup Program and is identified as Site # 0000402.

This RWP presents an exposure prevention strategy that protects receptors and manages potential risk from residual contaminants. The RWP is designed to addresses current and potential future exposure pathways at and around the Site in a manner protective of human health and the environment. The overall objective of the RWP is to remediate the Site impacts and mitigate exposure risks in accordance with a risk-based approach to closure, as provided for in the IDEM *Remediation Closure Guide* ("RCG") dated March 22, 2012 updated March 2018. The RWP Completeness Checklist (State Form 53413 [R/2-13]) is included in **Appendix A**.

1.1 Project Background

1.1.1 *Site Name, Address, and Telephone*

The Site is located in Washington Township (Township 12 North, Range 1 East, Section 34) as shown on the Martinsville, Indiana USGS 7.5-Minute Topographic Quadrangle Map (**Figure 1**). The Site's approximate latitude and longitude are 39° 25' 39'' North, 86° 25' 06'' West. The Site has an elevation of approximately 610 feet above mean sea level.

The Site is rectangular in shape, approximately 0.2-acre in size, and located in a residential/commercial area within the City of Martinsville. Residential properties are located north, east, south, and southwest of the Site with a commercial property to the west along East Morgan Street. **Figure 2** depicts the Site and surrounding areas.

1.1.2 *Current Owner and Contact Information*

Mr. and Mrs. John O'Neal purchased the Site in October 1993 and are the current owners. The contact information for Mr. and Mrs. O'Neal follows:

Mr. David L. Guevara, Ph.D.
Taft Stettinius & Hollister LLP
One Indiana Square, Suite 3500
Indianapolis, Indiana 46204-2023
(317) 713-3500

Mr. Jeremy S. Kinman, LPG, PG
Wilcox Environmental Engineering, Inc.
1552 Main Street, Suite 100, Speedway, IN 46224
(317) 472-0999

1.1.3 *Summary of Historical Site Ownership and Past and Present Operations*

The Site operated as a dry-cleaning facility from 1987 to 1996 and 1997 to 2011. The facility was utilized as a dry-cleaning drop-off and pick-up facility from 1996 to 1997 and since 2011. The facility operated as the Clothes Depot Cleaners until 2011 when the Site was leased under the name Vista Cleaners. The Site currently operates as Fabric Care Center.

1.1.4 *Release Discovery and Reporting*

A suspected release was discovered in October 2014 based on soil tetrachloroethene ("PCE") concentrations exceeding the RCG residential migration to groundwater screening level ("RMTGSL"). Multiple phases of soil, groundwater, and vapor investigations conducted by Wilcox are summarized in Section 1.2 below. The Site investigation area is depicted on **Figure 3**. **Table 1** provides a summary of documents accessible via IDEM's Virtual File Cabinet ("VFC") that detail environmental investigations, assessments and correspondence.

1.2 **Summary of Previous Investigations**

<u>Initial Site Investigation – March 2, 2014 (VFC# 80013845)</u>
The Initial Site Investigation ("ISI") included advancing three soil borings (HA-1, B-04, and B-05), and installing three permanent monitoring wells (MW-01 through MW-03). The monitoring wells were installed to collect groundwater samples and calculate the groundwater flow direction. Groundwater was generally measured from 10 to 12 feet bgs and flow was calculated to be west-southwest. PCE was reported in vadose soil and groundwater at concentrations exceeding the RMTGSL and RCG residential groundwater tap screening level ("RGWSL"), respectively. No other chlorinated volatile organic compounds ("cVOCs") were reported.

<u>Further Site Investigation – June 10, 2015 (VFC# 800060633)</u>
The 2015 Further Site Investigation ("FSI") included advancing three soil borings (B-06 through B-08) and installing three monitoring wells (MW-04 through MW-06) to provide additional horizontal characterization and to develop a preliminary conceptual site model ("CSM") to evaluate potential exposure pathways and receptors. The CSM is included as **Figure 4**. The extent of PCE concentrations in soil exceeding the RMTGSL was adequately defined. Additional groundwater investigation to refine the dissolved PCE plume was recommended.

<u>Further Site Investigation II – June 6, 2016 (VFC# 80305788)</u>
The FSI II utilized expedited site characterization methods using real-time analytical techniques to further evaluate the horizontal extent of PCE contamination. Activities included advancing 35 soil borings (B-09 through B-44) and installing 14 monitoring wells (MW-07 through MW-21). Subsequent groundwater monitoring results indicated the horizontal extent of the dissolved PCE plume was defined; however, PCE concentrations were present at levels exceeding the RCG residential vapor intrusion groundwater screening level ("RVIGWSL") at multiple locations in the pre-dominantly residential area southwest of and down-gradient from the Site. Cumulative groundwater grab data is summarized in **Table 2**. Wilcox deployed groundwater interface polyethylene diffusion bags ("PDBs") in eight down-gradient monitoring wells to evaluate concentration gradients within the water column. In general, most locations reported a decrease in PCE concentrations when sampled via surface PDBs. A significant concentration differential was

reported in distal wells MW-18 and MW-19. The data indicated that a shallow vertical distribution of COC concentrations exists within the water column becoming more prominent toward the distal end of the plume. Utilizing the PDB data, Wilcox identified multiple residential structures located within the RVIGWSL 100-foot buffer zone requiring vapor intrusion ("VI") evaluation. A VI summary is depicted graphically on **Figure 5**.

Site Status Update Report – November 18, 2016 (VFC# 80384262)
Wilcox installed five monitoring wells (MW-22 through MW-26) to provide enhanced characterization of the dissolved plume centerline and to define the southwestern edge of the plume.

2017 Winter Vapor Intrusion Sampling Update – May 4, 2017 (VFC# 80456408)
Wilcox attempted to obtain access to 13 residential properties for the 2017 winter worst-case scenario conditions, but only received access to four properties. The vapor results from the 740 East Washington Street residence placed it under *Scenario 6 (Remedy)* from IDEM's February 2014 *Vapor Remedy Selection and Implementation* guidance letter. Additionally, vapor data collected from the 760 East Washington Street residence placed it under *Scenario 3 (Remedy or indefinite sampling)*. Accordingly, Wilcox proposed to install a vapor mitigation system ("VMS") at the two residences to mitigate the sub-slab and indoor air vapor concentrations.

2017 Summer Vapor Intrusion Sampling Update – October 16, 2017 (VFC# 80540198)
Wilcox attempted to obtain access to 30 residential properties for the 2017 summer worst-case scenario conditions and received 16 returned agreements granting access. Wilcox attempted to schedule days and times with the 16 residents with only 10 responding to scheduling requests. An Access Request Summary is provided in **Table 3**. The summer 2017 VI sampling event was the first assessment for seven residential properties and the second for three residences. Wilcox recommended discontinuing VI evaluation at 40 North Colfax based on two consecutive compliant vapor sampling events.

Further Site Investigation III – December 11, 2017 (VFC# 80573635)
The FSI III investigation was designed to respond to the IDEM comment letter dated August 26, 2016 (Doc. 80342523) and was further refined in a February 21, 2017 meeting with IDEM personnel. Wilcox conducted a sewer camera investigation to further evaluate the integrity of the sanitary sewer in the alleyway between the Site building and North Graham Street. The camera investigation identified sewer line fractures and root locations that are suspected to be the likely points where cVOCs were introduced into the subsurface. Additional sewer investigation documentation is included in **Appendix B**. Wilcox advanced six relatively deeper soil borings identified as B-45/MIP-01 through B-50/MIP-06 on **Figure 3** utilizing a Membrane Interface Probe/Hydraulic Profiling Tool ("MIP/HPT") in order to collect real-time data to facilitate optimal placement of deep monitoring well screens and to evaluate the vertical extent of cVOCs along the dissolved plume centerline. Additional MIP/HPT investigation details are included in **Appendix C**. Two deep monitoring wells (MW-09D and MW-15D) were subsequently installed utilizing the MIP/HPT data. PCE was reported above the RGWSL in the groundwater sample collected from MW-09D.

Wilcox also advanced 17 soil borings (B-51 through B-67) to address horizontal data gaps along the perimeter of the groundwater plume and adjacent to the sanitary sewer. Soil boring logs and monitoring well construction diagrams are provided in **Appendix D**. No VOCs were reported in the groundwater samples collected from the shallow borings.

Additional activities included deploying four In-Situ Rugged Troll® pressure transducer data loggers at MW-18, MW-23, MW-25, and MW-26 in order to collect high-resolution groundwater elevation data, and surveying a subset of nine monitoring wells (NPL MW-4S, 4M, 4B, 28S, 29S, 32S, 34S, 35S, and 36S) associated with the Pike and Mulberry National Priority List ("NPL") site into the existing well network to provide a better understanding of regional groundwater flow patterns.

<u>2018 Winter Vapor Intrusion Sampling and Diagnostic Testing – June 21, 2018 (VFC# 82568160)</u>
VMS diagnostic evaluation was conducted at the 740 and 760 East Washington Street residences with a VMS subsequently installed at 740 East Washington based on the results. Diagnostic testing at the 760 East Washington Street residence indicated little to no influence from vacuum applied to the sub-slab due to building construction methods. Additionally, vapor samples were collected from seven residences to represent winter-worst case scenario conditions. Wilcox also collected vapor samples from the 760 East Washington Street residence to confirm previous compliant results. Based on two consecutive compliant vapor sampling events, Wilcox recommended discontinuing vapor sampling at the following residences:

- 660 East Jackson Street
- 39 South Ohio Street
- 40 South Ohio Street
- 60 South Ohio Street
- 89 South Ohio Street
- 90 South Ohio Street
- 759 East Washington Street
- 760 East Washington Street

<u>Vapor Mitigation System Installation and 30-Day Post Installation Sampling Report – 740 East Washington Street – September 14, 2018 (VFC# 82618175)</u>
A VMS was installed at the 740 East Washington Street residence. 30-day post-installation evaluation that included pressure field extension testing and vapor sampling indicated the VMS was operating as designed and the VI pathways were adequately mitigated. The VMS Operation, Maintenance, and Monitoring ("OMM") Plan is included in **Appendix E**.

<u>2018 Summer Vapor Intrusion Sampling Update: 659 East Washington Street – September 28, 2018 (VFC# 82625428)</u>
Wilcox previously collected compliant VI samples from the 659 East Washington Street residence on March 24, 2017 prior to the property being sold in August 2017. Access was obtained from the new property owner on July 30, 2018 and vapor samples were collected in August 2018 during summer worst-case conditions. Vapor results were below residential screening levels and Wilcox recommended VI sampling be discontinued based on two consecutive compliant events.

1.3 Recent Investigation

1.3.1 *Soil Sampling*

Wilcox advanced eight soil borings (B-68 through B-75) on June 6, 2019 to collect additional soil and groundwater data adjacent to the sanitary sewer line located in the alley as depicted on **Figure 3**. Direct-push probe methods were used to collect soil samples near the base of the sewer for laboratory analysis. Soil samples were classified in the field by a Wilcox geologist and were screened for the presence of total organic volatiles using a calibrated photoionization detector ("PID") equipped with a 10.6-eV lamp. Field screening results and soil boring logs are included in **Appendix A**. One soil sample was collected from each boring at the approximate base of the sewer at approximately 9-9.5 feet bgs in a manner consistent with EPA Method 5035A using Terracore™ containers and analyzed for VOCs by Pace.

1.3.2 *Direct Push Groundwater Sampling*

Grab groundwater samples were collected from each boring location to further refine the horizontal distribution of dissolved phase VOCs associated with former Site operations. The direct-push groundwater sampling locations are depicted on **Figure 3**. Discrete groundwater samples were collected from a 4-feet long stainless-steel screen point sampler using disposable tubing connected to a peristaltic pump. The screen point sampler was advanced to the desired depth and the probe rods were retracted to expose the screen. Multiple well volumes were purged prior to grab groundwater sample collection. Reusable equipment exposed to the subsurface was constructed of stainless-steel and decontaminated before each use. Samples were discharged directly into new, laboratory-provided containers and submitted to Pace for VOCs analysis.

1.3.3 *Soil Results*

Soil results are summarized in **Table 8** and depicted on **Figure 8**. PCE was reported at concentrations exceeding the RCG residential migration to groundwater screening level ("RMTGSL") in the samples collected from B-72 through B-75; however, none of the soil samples exceed a direct contact screening level. The laboratory report and chain-of-custody forms are included in **Appendix E**.

1.3.4 *Groundwater Results*

Cumulative grab groundwater analytical results are summarized in **Table 2**. PCE exceeded the RGWSL and/or the RVIGWSL in seven of the eight borings positioned adjacent to the sewer. No other VOCs exceeded screening levels. Similar to the distribution of soil impacts discussed above, PCE concentrations generally increased west along the sewer line although no samples exceeded the RCG commercial/industrial vapor intrusion groundwater screening level.

1.4 Contaminants of Concern

Characterization results have indicated that chlorinated hydrocarbons associated with dry-cleaning solvents (i.e., PCE) are present in soil, groundwater and vapor beneath the Site investigation area.

Accordingly, the contaminants of concern ("COCs") have been designated as cVOCs. **Table 4** summarizes Site COCs with their applicable screening levels.

1.5 Remedial Action Objectives

Remedial Action Objectives ("RAOs") are media-specific goals for protecting human health and the environment that are established based on the nature and extent of the contamination, the resources that are currently and potentially threatened, and the potential for human and environmental exposure. The RAOs identified for soil, groundwater, and vapor were chosen based on potentially contaminated media, potential transport mechanisms, and the evaluation of potentially complete exposure pathways at the Site and surrounding properties. Pathways identified as having potentially complete exposure to contaminated media will be addressed in the remediation plan. The RAOs selected for impacted media at the Site are described below.

Soil Remediation Action Objectives

Soils impacted with cVOCs are limited to the vadose zone at the Site and adjacent to the sanitary sewer system south and west of the Site property. RAOs for off-Site soil impacts are the RCG residential direct contact screening levels ("RDCSLs"). The on-Site soil RAOs are designated as the RCG commercial/industrial direct contact screening levels ("IDCSLs").

Groundwater Remediation Action Objectives

Ingestion of groundwater impacted by cVOCs is currently incomplete as the Site and surrounding areas are provided drinking water by the City of Martinsville. The closest water wells identified with the Indiana Department of Natural Resources ("IDNR") web viewer are Well #207288 (ca. 1954) and Well #207303 (ca. 1960) located approximately 0.25-miles southwest of the site (**Appendix F**). The water wells are listed as being owned by Home Lawn Sanitarium/Mineral Springs in the 1950s (now Costin Funeral Chapel). However; based on depth and stratigraphy, the wells (should they exist) are not expected to be impacted by the Site. Additional discussion of drinking water wells is included in Section 2.6.6. Institutional controls will be proposed on downgradient properties to the southwest to further prevent consumption of groundwater impacted with cVOCs, if necessary, to be protective of human health. Further, an institutional control is proposed for the Site property that prohibits installation of drinking water wells.

Groundwater contaminant mass reduction is recommended to limit the future expansion of dissolved cVOCs impacts. The RAO for groundwater will be documentation of either plume mass stability or a decrease in dissolved contaminant concentrations. Success in meeting this RAO will be documented through plume trend analysis (e.g., plume mass and/or statistical analysis), as specified in Section 4.6 of the RCG.

Potential risks associated with cVOCs impacts in groundwater are also linked to the VI pathway. RAOs specific to the VI pathway are discussed in the below sections.

Vapor Remediation Action Objectives

Indoor air ("IA") associated with the Site investigation area will be mitigated to RCG residential indoor air screening levels ("RIASLs") for residential structures. Respective RIASLs will be achieved either without the continued operation of a VMS, or if necessary, the continued operation of a VMS with an institutional control that requires the operation of the VMS with periodic confirmation air sampling. If an institutional control is required, such as an environmental restrictive covenant ("ERC"), the ERC will also preclude the use of the building space for daycare businesses.

Active VMS operation will be required at structures with IA concentrations exceeding an IA RAO until confirmation air sampling documents two successive sampling events with sub-slab vapors at concentrations below RCG residential sub-slab screening levels ("RSSSLs") and IA concentrations below applicable IA screening levels.

2.0 CONCEPTUAL SITE MODEL

2.1 Regional Geologic and Hydrogeologic Summary

The Site is located within the Martinsville Hills of the Southern Hills and Lowlands Region developed on resistant sandstone and siltstone. Unconsolidated deposits consisting of glacial outwash derived sand and gravel are estimated to be approximately 50 to 100 feet thick in the Site vicinity. Bedrock underlying the Site investigation area is composed of Mississippian siltstone, shale, and limestone of the Borden Group (Gray 1987). Bedrock was not encountered during the Site investigation; however, the depth to bedrock at the Pike and Mulberry NPL investigation area located approximately 0.59-mile west has reportedly been encountered at depths ranging from approximately 50 to 100 feet bgs[1], and is composed of siltstone and shale with varying amounts of weathering.

The regional groundwater flow pattern is generally toward the West Fork of the White River located approximately 2.2-miles to the west. The unconsolidated sand and gravel aquifer in the region produces yields from 100 to 2,000 gallons per minute ("gpm") based on a review of IDNR water well records included in **Appendix F**. The City of Martinsville municipal well field is located approximately 0.86-mile northwest of the Site and consists of three wells installed to depths ranging from 84 to 92 feet bgs in the sand and gravel aquifer. The wells are designated as Well #3 through Well #5 by Martinsville personnel. The listed well yield for the three relatively large diameter wells (24" to 36") ranges from 900 to 1,400 gpm. The City of Martinsville reported a total withdrawal of 572,239 gallons from the three significant withdrawal wells in 2017 with an average of 15,895 gallons per month. Yield from wells screened within bedrock is significantly less with listed pumping rates ranging from 10 to 50 gpm.

2.2 Site Investigation Area Soil

The USDA National Resource Conservation Service Custom Soil Resource Report for Morgan County (**Appendix G**) identifies two different soil types within the investigation area: Martinsville (loam), and Princeton (fine sandy loam). A summary of the report is below.

Martinsville loam (MeA), 0 to 2 percent slope, represents 73% of the investigation area soils. This unit is located on the southern portion of the area. The landform is characterized as outwash plains and stream terraces. The soils are typically characteristic of loam profiles to 9 inches, clay loam from 9 to 46 inches, sandy loam from 46 to 50 inches, and stratified sand to silt loam from 50 to 60 inches.

Princeton fine sandy loam (PrC), 2 to 6 percent slope, represents 27% of the investigation area soils. This unit is located on the north portion of the area. The landform is characterized as dunes. The soils are typically characteristic of fine sandy loam profiles to 40 inches, stratified loamy fine sand to fine sandy loam from 40 inches to 53 inches, and stratified fine sand to silt from 53 to 60 inches.

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[1] Final Remedial Investigation Report, Pike and Mulberry Streets PCE Plume Site, April 2018, prepared for the USEPA by ch2m.

2.3 Site Investigation Area Stratigraphy

Cross-section transects and geologic cross-sections showing generalized subsurface conditions are depicted on **Figure 6**. Soil boring logs and monitoring well construction diagrams are included in **Appendix D**.

Soils described at the investigation area are consistent and laterally continuous. The upper 6 to 10 feet consists of a clay unit with varying amounts of silt and sand. Soil grain-size samples collected from MW-22, MW-24, and MW-26 in September 2016 were classified as clayey sand, or silty-clayey sand. Beneath the clay, a massive sand unit with varying amounts of silt, clay and gravel was encountered to the maximum investigative depth of 38 feet bgs. Groundwater is typically encountered in the sand unit at 8 to 10 feet bgs.

The August 2017 MIP/HPT characterization at B-45/MIP-01 through B-50/MIP-06 (**Figure 3**) provides additional stratigraphic information. The HPT portion of the MIP/HPT system is designed to evaluate the hydraulic behavior of the encountered subsurface materials. As the probe is advanced, clean water is injected at a low flow rate. Injection pressure, which is monitored and plotted with depth, is an indication of the hydraulic properties of the subsurface, where a low-pressure response would indicate large grain size material and the ability to transmit water. Conversely, a high-pressure response would indicate small grain size material and the lack of ability to transmit water. A Wenner electrode array is also integrated into the HPT portion of the probe. This allows for the collection of soil electrical conductivity ("EC") data for lithologic interpretation. Generally, EC is inversely proportional to particle size, where clays have a higher conductivity than sands. The MIP/HPT summary report, MIP/HPT logs, and plots of data versus depth for each individual boring are included in **Appendix C**.

The electrical conductivity, HPT pressure, and HPT flow data collected by the MIP/HPT suggests the presence of an upper layer of fine-grained, relatively lower permeability deposits overlying coarser-grained, more permeable deposits. The stratigraphic interpretation of this data is consistent with soil cores collected at the investigation area to the maximum investigative depth of 38 ft. As depicted on the generalized hydrogeologic cross-sections (**Figure 6**), upper fine-grained deposits are generally 6 to 10 ft thick and consist primarily of lean clay, lean clay with sand, and clayey sand with sand present below. The MIP/HPT data additionally suggests a lower layer of fine-grained, lower permeability material is present along the dissolved plume centerline beginning at 39 ft at B-45/MW-9D and steadily increasing in depth in the down-gradient direction to approximately 48 ft at SB-50/MW-20. The MIP logs of B-46 and B-47 indicate the lower fine-grained sediments are present to approximately 54 feet, and are underlain by coarse-grained sediments to the maximum MIP/HPT investigated depth of 63 ft.

2.4 Site Investigation Area Hydrogeology

The Site investigation area hydrogeology is characterized by 29 relatively shallow monitoring wells installed to depths ranging from 16 to 20 feet, two relatively deeper monitoring wells installed at 35 and 37.5 feet, and nine NPL monitoring wells installed to depths ranging from 18 to 99 feet. The relatively shallow monitoring wells are screened across the shallowest observed saturated zones with 10 feet screens. The MIP/HPT data was used to determine well screen placement for the two relatively deeper wells. The screened intervals for MW-9D and MW-15D were installed from 32.5 to 37.5 ft, and 30 to 35 ft, respectively. The NPL wells are reported to be constructed with 10 ft screen lengths. The monitoring well network information is summarized in **Table 5**.

Groundwater Flow

The approximate potentiometric surface and groundwater flow direction in May 2019 are depicted on **Figure 7**. Groundwater flows generally to the west-southwest from a peak elevation at MW-03 located on the eastern portion of the Site property. The flow pattern gradually changes to west and then northwest downgradient of the investigation area near the NPL MW-04S location. A consistent northwest groundwater flow direction associated with the Pike and Mulberry NPL investigation has been described previously by others (ch2m, 2018), and is reportedly connected to the City of Martinsville municipal well field operations located approximately 0.86-mile northwest of the site. A west-southwest groundwater flow direction toward the White River located approximately 2.2-miles to the west would be expected without the reported hydraulic influence exerted by the municipal supply wells observed beyond the distal end of the dissolved plume near NPL MW-04S. Cumulative groundwater elevations are included in **Table 6**. Historical potentiometric surface maps are provided in **Appendix H**.

Appendix I provides a summary of graphical analysis of high-resolution groundwater data collected in September 2017 through May 2019 from pressure transducers deployed at MW-18, MW-23, MW-25, and MW-27. The graphs depict both groundwater flow direction and velocity (magnitude) for each well array. Each spoke represents the frequency with which groundwater flows at a certain velocity in a certain direction. The data are plotted on a linear scale. Additionally, histograms are provided for groundwater flow direction and velocity as well as a graphical depiction of changes in groundwater elevation. General statistics are also provided for groundwater flow direction, velocity, and elevation. In general, a statistical evaluation demonstrates minimal variation in groundwater flow direction, which ranges from west-southwest to southwest and is consistent with historical potentiometric surface interpretations included in **Appendix H**.

Groundwater Gradients

Groundwater elevations, well locations, and well screen intervals were used to calculate horizontal and vertical gradients. Horizontal gradients were calculated using the following formula:

$$i_h = \frac{dh}{dl}$$

Where:

i_h= Horizontal gradient
dh = Change in groundwater elevation between the start and end of flow line [L]
dl = Length of flow line over which the change in elevation occurs [L]

The average horizontal gradient calculated for May 2019 is 0.006 foot/foot. Horizontal gradients are moderately steeper in the eastern portion of the investigation area and flatten out down-gradient toward the distal end of the dissolved plume. For example, the horizontal gradient in the eastern portion of the investigation area averages approximately 0.006 foot/foot between MW-3 and MW-15 compared with 0.005 foot/foot between MW-16 to MW-20. Horizontal gradients continue to show minimal seasonal variations. The calculated hydraulic gradients from the transducer data indicate a relatively flat gradient with an average of 0.005 feet/foot and a maximum value of 0.006 feet/foot. The histograms indicate a relatively consistent flow direction and velocity with minimal variation.

Vertical gradients were calculated to evaluate the vertical component of groundwater flow using the shallow-deep well pairs MW-09/MW-09D and MW-15/MW-15D using the following formula:

$$i_v = \frac{dh}{dl}$$

Where:

i_v= Vertical gradient [unitless]
$dh =$ Change in groundwater elevation between the lower well (h_l) and the upper well (h_u) [h_u - h_l] [L]
$dl =$ Distance between the midpoint of the screens of the upper and lower wells [L]

A positive vertical gradient indicates that the groundwater flow is upward from the lower well toward the upper well while a negative vertical gradient indicates the flow is downward from the upper well to the lower well. The May 2019 vertical gradients calculated at MW-09/MW-09D and MW-15/MW-15D pair are -0.002 feet/foot and -0.001 feet/foot, respectively.

Hydraulic Conductivity

Slug tests were completed at MW-1, MW-15, MW-22, MW-24, and MW-26 in July 2017. Rising-head tests were completed at each specified well location. The average hydraulic conductivity for each well is summarized in **Table 7** and is generally consistent with a silty sand or clean sand (Freeze and Cherry, 1979) with an average hydraulic conductivity of approximately 150 feet/day. The AQTESOLV™ solutions for each slug test are included in **Appendix J** and the well construction details/boring logs are in **Appendix D**.

Linear Velocity

Advective transport is the transport of solutes by the bulk movement of groundwater. Advection is an important process driving dissolved contaminant migration in the subsurface and is critical to understanding contaminant fate. The linear groundwater velocity in the direction parallel to groundwater flow caused by advection is given by:

$$V_g = \frac{K}{n_e}(i_h)$$

Where:

V_g = average linear groundwater velocity parallel to the direction of groundwater flow [L/T]
K = hydraulic conductivity [L/T]
n_e = effective porosity [L^3/L^3]
i_h= horizontal hydraulic gradient [L/L]

The average linear (advective) groundwater velocity in the sand and gravel aquifer beneath the Site investigation area is 4.1 feet/day, or ~1,500 feet/year using the average hydraulic conductivity (150 feet/day), the May 2019 average horizontal hydraulic gradient (0.006 feet/foot), and an estimated effective porosity of 0.22.

2.5 Physical and Geographic information

The Site is located at 833 East Morgan Street, east of the intersection of North Colfax Street and East Morgan Street in Washington Township (Township 12 North, Range 1 East, Section 34) (**Figure 1**). The approximate latitude and longitude of the Site are 39° 25' 39'' North, 86° 25' 06'' West. The Site has an elevation of approximately 610 feet above mean sea level.

The Site is rectangular, approximately 0.2 acres in size, and located in a residential/commercial area within the City of Martinsville. Residential properties are located north, east, south, and southwest of the Site with a commercial property to the west along East Morgan Street. **Figure 3** depicts the layout of the Site and surrounding areas.

2.6 Extent of Subsurface Work

2.6.1 *Boring and Monitoring Well Logs*

Boring logs and monitoring well construction diagrams are included in **Appendix D**.

2.6.2 *Boring and Well Location Maps*

Boring and well locations are depicted on the attached figures.

2.6.3 *Field Data for Soil and Groundwater*

Field screening results are included on soil boring logs in **Appendix D** and groundwater field sampling data are provided within groundwater monitoring reports referenced in **Table 1**.

2.6.4 *Summary of Site Investigation*

Soil

Wilcox completed 83 soil borings and 31 permanent monitoring wells during the Site characterization to define the nature and extent of soil and groundwater contamination. As summarized in **Table 8**, soil PCE concentrations exceeding the RMTGSL are present at the following locations and depths: HA-01 (3-3.5'), HA-01 (3.5-4'), B-08 (1-2'), MW-04 (3-4'), MW-10 (3-4'), B-72 (9-9.5'), B-73 (9-9.5'), B-74 (9-9.5'), and B-75 (9-9.5'). PCE soil concentrations above RMTGSLs range from 0.0531 mg/kg at B-72 (9-9.5') to 7.71 mg/kg at HA-01 (3-3.5'). TCE impacts at B-08 (1-2') and B-71 (9-9.5') were detected above laboratory detection levels but below the RMTGSL. No other VOCs have been reported in soil samples at concentrations above laboratory detection levels. A Soil Analytical Results Map is provided as **Figure 8.**

Groundwater

PCE groundwater contamination exceeding the RGWSL is present at the following wells: MW-01, MW-06, MW-08 through MW-10, MW-12 through MW-19, MW-22, MW-24, MW-26, and MW-28. Dissolved PCE levels range from 6.0 micrograms per liter ("µg/L") at MW-18 to 156 µg/L at MW-15. Groundwater data is provided in **Tables 9** and **10**. The May 2019 groundwater analytical results are depicted on **Figures 9** and **10**.

Vapor

Vapor concentrations exceeding the RIASL and/or RSSSL have been reported at the following residential structures: 39 South Ohio, 40 South Ohio, 659 East Washington, 740 East Washington, 759 East Washington, and 760 East Washington. PCE vapor impacts range from 60.6 $\mu g/m^3$ at the crawlspace location to 12,000 $\mu g/m^3$ at the first-floor sub-slab location of 740 East Washington Avenue. Vapor analytical data is provided in **Table 11**. A VI summary is depicted on **Figure 5**.

2.6.5 ***Identification of Contaminants of Concern***

The designated COCs for all media at the Site are classified as chlorinated hydrocarbons, more specifically PCE and its breakdown products TCE, cDCE, tDCE, and VC. **Table 4** summarizes the COCs and their respective RCG screening levels applicable to the Site investigation, remediation, and subsequent closure activities.

Chlorinated hydrocarbons associated with the Site investigation area are generally characterized by double bonds, the presence of chlorine, and have many applications such as solvents, degreasers, and dry-cleaning agents. In general, chlorinated hydrocarbons have low to moderate solubilities, high volatilities, low to moderate partition coefficients, high mobilities, and densities greater than water. As a result, they are relatively easily leached from the soil into the groundwater (if conditions are suitable) and can migrate in a dissolved phase in the direction of groundwater flow forming relatively large plumes. Additional properties specific to each cVOC are discussed below.

2.6.5.1 Chemical and Physical Properties

Tetrachloroethene (C_2Cl_4) – a colorless liquid with a chloroform-like odor. It has a molecular weight of 165.83, a boiling point of 121°C, a specific gravity of 1.623, a solubility of 150 mg/L, and a freezing/melting point of -19°C. CAS No.: 127-18-4.

Trichloroethene (C_2HCl_3) – a colorless liquid with sweetish, chloroform-like odor. It has a molecular weight of 131.39, a boiling point of 87°C, a specific gravity of 1.469, a solubility of 1,550 mg/L, and a freezing/melting point of -73°C. CAS No.: 79-01-6.

Cis-1,2-Dichloroethene ($C_2H_2Cl_2$) – a colorless liquid with a chloroform-like odor. It has a molecular weight of 96.94, a boiling point of 60.3°C, a specific gravity of 1.284, a solubility of 3,550 mg/L, and a freezing/melting point of -80.5°C. CAS No.: 156-59-2.

Trans-1,2-Dichloroethene ($C_2H_2Cl_2$) – a colorless liquid with a chloroform-like odor. It has a molecular weight of 96.94, a boiling point of 47.5°C, a specific gravity of 1.257, a solubility of 6,330 mg/L, and a freezing/melting point of -50°C. CAS No.: 156-60-5.

Vinyl Chloride (C_2H_3Cl) – a colorless gas at ambient temperature with a mild sweet odor in high concentrations. It has a molecular weight of 62.50, a boiling point of -13.37°C, a specific gravity of 0.91, a solubility of 1,110 mg/L, and a freezing/melting point of -153.8°C. CAS No.: 75-01-4.

2.6.5.2 Contaminant Toxicological Data

Contaminant toxicological information is included in the Health and Safety Plan provided as an attachment to the Quality Assurance Project Plan ("QAPP") in **Appendix K**.

2.6.6 ***Exposure Pathway Evaluation***

Evaluation of Soil Exposure Pathways

The soil direct contact pathway is currently incomplete at the Site due to the presence of asphalt, gravel, and the Site building present over the area of soil contamination. The potential for soil to be brought to the surface during sub-grade work in the future could possibly complete the exposure pathway. However, none of the reported soil concentrations exceed the commercial/industrial or excavation direct contact screening levels (**Table 8**) thus future exposure does not pose an unacceptable risk.

Evaluation of Groundwater Exposure Pathways

Based on the observed concentrations of COCs in groundwater (**Table 9**), the migration to groundwater pathway is complete; however, this is an indirect pathway and the risk of exposure via this pathway is related to direct contact with groundwater (see below) and is low.

Potential groundwater receptors have been identified in the Site investigation area. The closest water wells identified with the IDNR web viewer are Well #207288 (ca. 1954) and Well #207303 (ca. 1960), located approximately 0.25-miles southwest of the site. The water wells are listed as being owned by Home Lawn Sanitarium/Mineral Springs in the 1950s (now Costin Funeral Chapel). Well #207303 is set approximately 950 feet bgs, and the likelihood of this well (should it still exist) being impacted by the Site is minimal. Well #207288 is constructed with 10 feet of screen to a depth of approximately 85 feet bgs. Based on the water well record, an 11-feet thick clay is located at 31 feet bgs. This clay would impede potential vertical migration of the relatively shallow dissolved impacts identified at the Site investigation area. Additionally, MW-15D, which is located above the low-permeable clay unit approximately 500 feet upgradient of well #207288, did not identify detectable concentrations of COCs. Given it's intended use (i.e. former closed spa), age of well, the presence of an intervening clay unit, and non-detectable concentration of COCs above the clay unit, the likelihood that this well (should it still exist) being impacted by the Site is minimal.

The City of Martinsville municipal well field is located approximately 0.86-mile northwest of the Site and consists of three high-capacity water wells designated as wells #3 through #5, as discussed above in Section 2.1. The City has designated wellhead protection areas (capture zones) around the well field. The location of the wellhead protection areas with respect to the Site investigation area and dissolved plume are depicted on **Figure 11** and apply to the unconsolidated sand and gravel aquifer. As depicted on **Figure 11**, the dissolved plume is oriented from northeast to southwest in the direction of groundwater flow, is approximately 1,700 feet in length, and spans wellhead protected and unprotected areas. The northern portion of the plume positioned north of East Washington Street is located outside the wellhead protection area, while the portion of the plume south of East Washington Street is positioned inside the wellhead protection area. The dissolved plume terminus is located approximately 3,200 feet from the nearest municipal well identified as Well #3. The City's well field is not considered at risk of being impacted by the dissolved plume due to distance.

Vapor Exposure

Dissolved PCE has been reported at levels exceeding the RVIGWSL in the Site investigation area (**Tables 2** and **9**). Wilcox identified 30 structures located within the RVIGWSL 100-foot buffer zone and submitted access requests to those property owners (**Table 3** and **Figure 5**). Of the 30 identified structures, 16 property owners agreed to allow access for vapor intrusion sampling to be conducted at the structures. During the 2017 and 2018 VI assessments, Wilcox conducted vapor intrusion sampling at 11 of the 16 residences where access had been granted, while the remaining five residences did not respond to sampling schedule requests. The results of the most recent summer 2018 sampling assessment are included in the *2018 Summer Vapor Intrusion Sampling Update – 659 East Washington Street*, dated September 28, 2018 (VFC #82625428).

Based on the analytical data obtained during the 2017 and 2018 VI assessments, Wilcox has determined the following:

- 40 North Colfax Street – compliant, VI sampling discontinued
- 660 East Jackson Street – compliant, VI sampling discontinued
- 39 South Ohio Street – compliant, VI sampling discontinued
- 40 South Ohio Street – compliant, VI sampling discontinued
- 60 South Ohio Street – compliant, VI sampling discontinued
- 89 South Ohio Street – compliant, VI sampling discontinued
- 90 South Ohio Street – compliant, VI sampling discontinued
- 659 East Washington Street – compliant, VI sampling discontinued
- 740 East Washington Street – VMS installed, post-installation VI sampling confirmatory results compliant
- 759 East Washington Street – compliant, VI sampling discontinued

- 760 East Washington Street – compliant, VI sampling discontinued

The results of the VI assessments have indicated that VI is not occurring at unacceptable levels at the tested residences identified within the RVIGWSL 100-foot buffer zone on **Figure 5**, and the pathway is considered incomplete.

2.7 Site Contamination

2.7.1 *Discussion of Sources of Contamination*

The Site has historically operated as a dry-cleaning facility using PCE during the active operational phases. A release was not reported during active operation. A release was discovered in October 2014 based on laboratory data reporting PCE in soil at concentrations exceeding the RMTGSL. The Site was entered into the IDEM State Cleanup Program and assigned Site #0000402.

A potential release source is suspected to be the sanitary sewer system located at and southwest of the Site. Sewer camera investigation activities identified sewer line fractures west of the Site where COCs were likely introduced into the subsurface. Additional support for this conclusion is discussed in the below section.

2.7.2 *Extent of Contamination*

Soil analytical results are provided in **Table 8**. PCE soil contamination exceeding RMTGSLs is generally limited and has been identified in vadose zone soil at the Site and adjacent to the sanitary sewer system south and west of the site property at seven locations (B-08, B-72, B-73, B-74, B-75, MW-04, and MW-10). The lack of vadose zone soil contamination at and around the Site supports the sanitary sewer acting as a release mechanism.

Cumulative groundwater analytical data are summarized in **Table 9** and are depicted on **Figures 9** and **10**. In general, PCE concentrations exceeding the RGWSL are located on-Site near the southwest corner of the property and extends off-Site to the southwest in the direction of groundwater flow for approximately 1,700 feet. Groundwater samples collected from 18 monitoring wells had PCE concentrations above the RGWSL of 5 µg/L, three of which also exceeded the RVIGWSL of 110 µg/L. No sample contained PCE concentrations above the industrial vapor intrusion groundwater screening level. PCE concentrations ranged from 4.7 µg/L at MW-04 to 208 µg/L at MW-24. No other cVOCs were detected above laboratory reporting limits.

The occurrence and distribution of groundwater PCE concentrations (**Figure 10**) suggests a release occurred from the sanitary sewer system southwest of the Site at a fracture(s) in the sewer line. The lack of detections in the grab groundwater samples collected from borings along East Washington Street and west of MW-10 positioned in the alley immediately to the north suggests cVOCs transported in the sewer line discharged into the subsurface between MW-4 and MW-10. As discussed in Section 1.3.3, PCE was reported at concentrations above the RMTGSL in soil samples collected from near the base of the sewer in June 2019; however, no samples exceeded the RDCSL.

Characterization data collected during investigation activities do not support the presence of dense non-aqueous phase liquid ("DNAPL") based on the following lines of evidence ("LOEs"):

- Soil concentrations do not increase with depth, as indicated by the most impacted borings at the site (HA-01 and B-08);
- The PCE concentrations reported at MW-15D have been less than its shallow counterpart MW-15 in each instance of sampling;
- Pre-pilot test dissolved PCE concentrations at MW-09D have been less than levels reported at MW-09;
- The historical maximum dissolved PCE concentration reported during Site investigation activities is 376 µg/L at MW-09 during the September 2016 groundwater monitoring event, and is an order of magnitude below 1% of solubility for PCE; and,
- The August 2017 MIP/HPT investigation utilized a halogen-specific detector ("XSD") to identify chlorinated contaminants and reported relatively low-level responses at each MIP/HPT boring location indicating the majority of the dissolved contaminant mass is located in the upper 20 feet of the aquifer.

2.7.3 *Plume Behavior*

As discussed above in Section 2.7.1, the sanitary sewer located southwest of the Site is a suspected release mechanism. Results from soil samples collected near the base of the sewer in June 2019 provides additional supporting evidence that residual-phase cVOCs are present adjacent to and potentially under the fractured sewer line providing an on-going source for groundwater contamination. Contaminant loading during infiltration occurs after water transported through the sewer enters damaged portions and migrates vertically leaching residual adsorbed contaminants. Once cVOCs are dissolved in groundwater, they migrate in the direction of flow as a contaminant plume through advection. During migration, the concentration of cVOCs is subject to natural attenuation processes, including:

- Dispersion and Diffusion;
- Adsorption;
- Volatilization; and,
- Biodegradation.

As the dissolved plume migrates, it mixes with relatively uncontaminated groundwater as a result of variations in groundwater velocity and the aquifer's sand and gravel matrix (Fetter, 1994). The Site investigation area is located in a residential area characterized by unpaved ground surfaces allowing increased rates of infiltration and groundwater recharge as compared to commercial settings. The dilution of the contaminant concentration that occurs is described as mechanical dispersion (Fetter, 1994). Diffusion results from movement of dissolved contaminants from zones of high concentration to zones of low concentration resulting in no net contaminant loss.

The presence of residual impacts present near the sewer results in a groundwater contaminant plume while a one-time or intermittent spill would likely result in a contaminant slug with different characteristics (Fetter, 1994). Dissolved contaminants typically migrate slower than the groundwater in which they are dissolved due to interaction with the sand and gravel aquifer matrix. These interactions, primarily adsorption onto solids, remove the contaminant from the groundwater and slow its movement in groundwater. For cVOCs, the amount of organic carbon present in the aquifer is important in determining the amount of adsorption that is occurring (Weidemeier, 1998). In addition, volatile compounds such as cVOCs will volatilize from groundwater into the unsaturated zone above the water table consisting of permeable sand and gravel potentially resulting in VI.

A key mechanism of natural attenuation for dissolved cVOCs is biodegradation, specifically reductive dechlorination (Weidemeier, 1998). Reductive dechlorination is the process by which chlorinated compounds are progressively dechlorinated, assuming the presence of sufficient bacteria and electron donors, such as anthropogenic or natural organic carbon (Weidemeier, 1998). During the process, the chlorinated hydrocarbon is used as an electron acceptor, and chlorine atoms are progressively replaced by hydrogen, resulting in compounds with less chlorine.

Chlorinated hydrocarbon plumes exhibit varying behavior characteristics depending on the contaminant mass size, the amount of biologically available organic carbon in the aquifer, the distribution and concentration of natural electron acceptors, and the types of electron acceptors being used (Weidemeier, 1998). The Site investigation area dissolved plume is characterized by Type 3 behavior that is defined by the following:

- Permeable sand and gravel aquifer with low amounts of native and/or anthropogenic carbon;
- Aerobic environment with an average dissolved oxygen ("DO") concentration of 5.16 mg/L;
- Large flux of electron acceptors including elevated concentrations of nitrate, manganese, iron II (ferric), and sulfate; and
- Absence of PCE degradation byproducts including TCE, cDCE, tDCE and VC, and methane.

Wilcox evaluated dissolved PCE trends for monitoring wells with concentrations exceeding the RGWSL. Graphs depicting dissolved PCE concentration over time are provided in **Appendix L**. PCE concentrations moderately fluctuate due to seasonal variability.

2.8 Summary of Risks Associated with Site

2.8.1 *Human, Ecological, and Environmental Risks*

The surrounding commercial and residential properties are potential human receptors; however, complete pathways to these receptors do not currently exist or are being mitigated. Residences down-gradient of the source area that were not previously investigated due to access denials may have complete VI pathways based on their proximity to the dissolved plume. Additionally, the southern portion of the dissolved plume is located within a wellhead protection area (**Figure 11**).

A sensitive-receptors map generated for the Site investigation area using information from Indiana Map (http://www.indianamap.org/) and local resources is included in **Appendix M**. The sensitive receptor identified within the area is the Central Elementary School located southwest of the Site and approximately 80 ft south of the distal edge of the dissolved plume. The dissolved plume has not adversely impacted the school as the groundwater COCs have not been detected above the RGWSLs in the downgradient sentinel monitoring wells MW-21 and MW-23 positioned between the school and the plume (**Figure 10**).

The nearest body of water to the Site Investigation Area is the Sartor Ditch located approximately 0.35-miles to the east-southeast. A copy of the National Wetlands Inventory Map generated from the US Fish and Wildlife Service website is included in **Appendix N**. The likelihood of the release impacting ecological receptors appears minimal based on the subsurface nature of the contamination and the proximity to the contaminant plume. According to the IDNR Indiana Natural Heritage Data Center, there are no endangered, threatened, or endangered ("ETR") species or significant areas documented within 0.5 mile of the Site investigation area. A copy of the IDNR letter is included in **Appendix O**.

The known contaminant mass located at the Site investigation area site occurs beneath the Site building and/or at depths in soil and groundwater exceeding 10 feet. Investigations have documented that impacted groundwater is not discharged to surface habitats. Potential adverse effects on endangered and protected flora and fauna and other vegetation and wildlife populations have not been observed, nor are they anticipated.

2.8.2 *Impact on Current and Future Land Uses*

Impacts to the current or future land uses are not anticipated, as the land uses are unlikely to change in the near term. Potential impacts related to future residential development will be mitigated over time by the proposed groundwater remediation.

2.9 **Vapor Intrusion**

2.9.1 *Discussion of Groundwater Results Compared to the Remediation Closure Guide*

COCs have been reported in groundwater at several locations at concentrations exceeding the RGWSLs and/or RVIGWSLs at the Site and surrounding properties. Analytical results for PCE exceeding the RVIGWSL have been reported in multiple groundwater monitoring wells to the south and southwest of the Site property. Accordingly, vapor intrusion evaluation was completed at potentially affected surrounding properties where access agreements were secured, as described above in section 1.2. A vapor mitigation system was installed at one residence (740 East Washington Street) to the southwest to mitigate the VI pathway. Results from the most recent groundwater monitoring event completed in May 2019 indicate groundwater is impacted with PCE concentrations exceeding the RGWSL and/or RVIGWSL at the following locations: MW-01, MW-04, MW-06 through MW-08, MW-09D, MW-12 through MW-15, MW-15D, MW-16 through MW-20, MW-22, MW-24, MW-26, and MW-28.

2.10 **Description of additional monitoring required for delineation**

Soil and groundwater impacts have been adequately characterized and no further investigation is necessary. Cumulative soil results are summarized on **Figure 8**. Groundwater data from May 2019 is depicted on **Figure 10**. Based on the groundwater data, historical vapor sampling results, and the OMM plan included in **Appendix E**, additional VI evaluation is planned for the 740 East

Washington Street residence under Schedule 1 for the 2019-2020 winter heating season. Groundwater monitoring activities will be completed in accordance with the Sampling and Analysis Plan ("SAP") provided as an attachment to the QAPP included in **Appendix K**.

3.0 REMEDIATION PLAN

As detailed in previous sections, the areas of impacted media at the Site investigation area have been characterized to residential screening levels, and RAOs protective of potentially complete exposure pathways have been developed (Section 1.4). The remedial actions specified by this work plan are intended to reduce the concentrations of PCE and its associated degradation products, where present, to prevent unacceptable levels of human health risk from exposure to COCs in soil, groundwater and vapor. The overall remedial strategy consists of: (1) reducing contaminant mass in the on-going source area located adjacent to the sanitary sewer present in the alley between the Site building and North Graham Street running east to west (**Figure 3**); (2) reducing dissolved contaminant mass down-gradient in order to prevent exposure to potential receptors; and, (3) further reducing potential risk by limiting or eliminating exposure pathways with institutional controls such as an ERC.

The following sections discuss current engineering controls, the completed pilot test, evaluation of remedial alternatives, the selected remedial technologies, the proposed monitoring plan, as well as quality assurance and health and safety procedures.

3.1 **Current Engineering Controls**

Wilcox and Protect Environmental ("Protect") completed VMS installation activities in April 2018 for the 740 East Washington Street residence, depicted on **Figure 12**. The VMS utilizes two individual fans designed to mitigate the potential for chlorinated contaminant vapors by introducing vacuum beneath the slab and exchanging the air in the crawlspace portion of the structure. This is accomplished using a series of blowers piped to vertical and horizontal extraction points throughout the building.

Extraction pits ("EPs") were installed by coring through the slab using a 5-inch, diamond-tipped, concrete coring bit. Protect removed approximately 10 gallons of gravel and soil from each EP to create void space around the end of the EP to facilitate the collection of vapors. The EPs are connected to 3-inch diameter polyvinyl chloride ("PVC") conveyance piping and piped to exterior exhausting blowers. Each extraction point was equipped with Dwyer series 2-5000 Minihelic® differential pressure gauge to measure the inches of water column vacuum at each EP.

Two RadonAway® High Suction Series blowers (a GP-501 for the sub-slab portion and an RP-265 for the crawlspace air exchange portion) were selected for the VMS. The blower's electrical connection was made by connecting each blower to an electrical sub-meter connected to one of the main electrical panels within the building. Additional information including system design schematics are included in **Appendix E**.

As described in Section 1.4, active VMS operation will be required at structures with IA concentrations exceeding an RAO until confirmation air sampling documents two successive sampling events with sub-slab vapors at concentrations below RCG RSSSLs and IA concentrations below applicable IA screening levels.

3.2 Evaluation of Remedial Alternatives

This section presents an evaluation of the remedial alternatives to achieve the RAOs. The evaluation is summarized in **Table 12**. The following criteria were used to select appropriate technologies for consideration as remedial alternatives:

- Contaminant type;
- Anticipated regulatory closure criteria;
- Geologic and hydrogeologic setting;
- Expected time required to achieve closure; and,
- Remedial cost.

Based on these criteria, the following remedial alternatives were selected for additional evaluation:

- Alternative #1 – Soil Excavation and Disposal;
- Alternative #2 – Pump and Treat Groundwater Extraction ("GWE");
- Alternative #3 – Multiphase Extraction ("MPE");
- Alternative #4 – Air Sparge with Soil Vapor Extraction ("AS/SVE");
- Alternative #5 – *In-Situ* Chemical Reduction ("ISCR") with Bioaugmentation;
- Alternative #6 – Permeable Reactive Barrier ("PRB");
- Alternative #7 – Vapor Mitigation System ("VMS");
- Alternative #8 – Residual Soil Contamination Isolation; and,
- Alternative #9 – Institutional Controls Combined with a Plume Behavior Demonstration.

3.2.1 *Soil Excavation and Disposal*

Technology Description

Soil excavation is effective for the permanent removal of contaminants. Excavation involves the physical removal of impacted soils, and transportation of the waste to a permitted treatment, storage, and disposal facility. Areas of excavated soils are typically backfilled with clean fill material and restoration of the surface.

Applicability

Soil excavation could be effective for the limited quantity of impacted shallow soil. However; PCE concentrations in soil are relatively low (i.e., below direct contact), and are present under the Site building and adjacent to the sanitary sewer, which may be difficult to excavate at depth. Soil excavation and disposal is not a reasonable remedial alternative and was not considered further.

3.2.2 *Pump and Treat Groundwater Extraction*

Technology Description

Conventional groundwater pumping and treatment technology has proven to be effective in controlling the migration of dissolved COCs. This is accomplished by establishing a groundwater capture zone, typically requiring a series of recovery wells. In addition to controlling migration, groundwater pump and treatment systems also remediate chlorinated hydrocarbons in the saturated soils and groundwater via extraction. Through groundwater pumping, groundwater flow is induced in the direction of the recovery wells or trenches. As groundwater flows toward the wells, chlorinated hydrocarbons adsorbed to the saturated soil particles can desorb into the captured groundwater, which is then pumped to the surface for treatment. This remedial technique typically operates for a longer period of time than other remedial options because contaminants must be drawn through the subsurface to the recovery well(s) and desorb from the soil particles.

Applicability

Based on hydrogeologic data, the water-bearing unit at the Site investigation area is a medium to coarse sand and gravel with an extensive saturated thickness. The unit is expected to transmit moderate to large volumes of water beyond the initial dewatering. The anticipated volume of water that would be removed and treated would likely require a GWE system to be in operation over a period of many years to adequately remove the adsorbed and dissolved cVOCs. Additionally, the effectiveness of a GWE remediation approach decreases over time due to the number of pore volumes of groundwater that must be removed to remediate groundwater to an acceptable level. Therefore, GWE was not considered further.

3.2.3 ***Multiphase Extraction***

Technology Description

MPE removes dissolved and vapor-phase contamination in the saturated and vadose zone by establishing groundwater drawdown in the area of the extraction well(s) and inducing airflow through the dewatered subsurface soil matrix. Essentially, high vacuum is used to remove groundwater from extraction wells (to a maximum depth of approximately 30 feet) without the aid of a groundwater pump and is capable of exerting a greater radius of influence per extraction well on less permeable soils than comparatively low-vacuum, soil vapor extraction. Once drawdown equilibrium is achieved, MPE removes air in the same manner as soil vapor extraction ("SVE") technology. The higher vacuum associated with MPE strips more volatile contaminants from extracted groundwater than lower vacuum systems or stripper systems equipped with groundwater pumps (see above). Consequently, vapor emissions are relatively higher and extracted groundwater concentrations are relatively lower.

Applicability

Utilizing MPE in highly permeable hydrogeologic settings will generally cause excessive water extraction. Additionally, a pilot study would need to be conducted to determine if this technique is appropriate for the Site conditions. Periodic operation and maintenance would need to be completed to monitor the performance of the system, adding to the costs associated with MPE. Due to the cost of installing, operating and maintaining a remediation system at the Site, this technique does not appear to be the most cost-effective remedial option for the Site.

3.2.4 *Air Sparge with Soil Vapor Extraction*

Technology Description

Combined AS/SVE technologies are effective *in-situ* remediation technologies for mass removal of cVOCs. AS is the process of injecting oxygen into the contaminated aquifer through a series of injection wells screened within the saturated zone. Injected air is used to strip cVOCs through volatilization. This technology is used in conjunction with SVE to collect the vapor phase contaminants. The SVE system includes several vapor extraction wells installed within the vadose zone. The effectiveness of AS/SVE is affected by soil permeability and contaminant volatility. Based on the stratigraphy of the Site investigation area and COCs characteristics, this method would be suitable for groundwater remediation.

Applicability

Although AS/SVE systems have proven to be effective on similar sites, AS/SVE systems are costly to install and operate. Utilizing this technology would require a pilot study to determine the radius of influence and effectiveness. Additionally, the dissolved plume area is relatively large and is located off-Site under roads, right-of-way areas, and residences. Installation of an AS/SVE system would likely include trenching and repaving or horizontal wells, both increasing the cost of implementation. Due to the cost of installing, operating and maintaining an AS/SVE remediation system at the Site, this technique does not appear to be the most cost-effective remedial option for the Site.

3.2.5 *In-Situ Chemical Reduction with Bioaugmentation*

Technology Description

ISCR is a technology that encourages growth and reproduction of microorganisms to accelerate the biodegradation of organic constituents that are dissolved in groundwater and adsorbed into the aquifer matrix. ISCR generally requires a mechanism for stimulating and maintaining the activity of microorganisms responsible for the degradation of contaminants. In remediating chlorinated hydrocarbons, this mechanism usually involves modifying subsurface conditions by the addition of specific food substrates to stimulate reductive dechlorination and/or aerobic co-metabolism reactions, which, under optimal conditions, can completely convert chlorinated hydrocarbons to harmless by-products.

ISCR involves the transfer of electrons from the substrate to the chlorinated hydrocarbon. The substrate loses electrons and is oxidized, while the chlorinated hydrocarbon gains electrons and is reduced (Weidemeier, 1998). The chemical structure of the chlorinated hydrocarbon determines how susceptible it is to reduction. In general, solvents with electron-rich carbon atoms are more susceptible to oxidation, while carbon atoms that are electron deficient are more susceptible to reduction. Additionally, the more chlorines added to a solvent molecule, the more oxidized it becomes and the more resistant it is to further oxidation, but the more susceptible it is to reduction.

Chlorinated hydrocarbons can be degraded by anaerobic microbes known as reductive dechlorinators. This form of biodegradation requires reducing conditions to stimulate anaerobic bacteria to dechlorinate cVOCs. The approach is designed to provide a carbon substrate or electron donor source to create reducing conditions necessary to enhance anaerobic biodegradation. Technologies such as Hydrogen Release Compound® ("HRC") add a carbon substrate to groundwater to promote growth of native microorganisms that degrade cVOCs through anaerobic respiration processes. The injections infuse carbon substrates into the saturated and smear zones through multiple injection points to promote anaerobic conditions and enhance microbial degradation of cVOCs.

Bioaugmentation involves the addition of microorganisms to enhance the native population of chlorinated hydrocarbon degrading bacteria and is usually performed through injection. Various formulations of bioaugmentation are available for use, with most including populations of *Dehalococcoides* ("DHC"), which has been demonstrated to completely degrade parent cVOCs to ethene. Bio-Dechlor INOCULUM Plus ("BDI Plus") is an enriched, natural microbial consortium containing species of DHC which are capable of completely dechlorinating contaminants during *in-situ* anaerobic bioremediation processes. This technology is often used following carbon substrate addition to take advantage of the food source and anaerobic conditions provided by the substrate.

Applicability

The primary advantages of using ISCR combined with bioaugmentation are that it is relatively non-disruptive in nature, does not require ongoing maintenance activities, and does not present a threat to human health or environmental quality. Since impacted groundwater is not removed from the subsurface or treated and then discharged above the ground surface, there are no concerns with direct contact with the water, and as such, no possibility of direct human or ecological exposure. In addition to the decreased risk of environmental impact by using this method, it also causes essentially no disturbance to the Site and surrounding area.

The general disadvantages of this technology are the more significant initial cost, the potentially longer period of cleanup time required, and the need to monitor the aquifer geochemistry to ensure that conditions remain conducive for biodegradation. Additionally, chlorinated hydrocarbon reduction due to biological transformation does not ensure a reduction in toxicity. Many of the daughter products of transformation processes are as toxic, or more toxic, than their parents. Biotransformation of PCE, for example, can result in the formation of vinyl chloride, which is more toxic (and stable) than its parent (Weidemeier, 1998). ISCR with HRC and bioaugmentation with BDI Plus followed by monitored natural attenuation ("MNA") is considered to be a viable combined technology for the Site. A successful ISCR pilot test was completed at the Site, as provided in Section 3.2.9.

3.2.6 ***Permeable Reactive Barrier***

Technology Description

A PRB is an *in-situ* permeable treatment zone designed to intercept and remediate a dissolved contaminant plume allowing groundwater to flow through without mechanical assistance that could potentially alter the existing groundwater hydrology. As the plume migrates through the PRB, the dissolved contaminants are either immobilized or chemically transformed to a more desirable (e.g., less toxic, more readily biodegradable, etc.) state. Therefore, a PRB is a barrier to contaminants, but not to groundwater flow. PRBs can be installed at various locations along a plume and are designed to address different site-specific objectives. For example, a PRB installed near a source area may be designed to reduce mass flux and act as a source term management remedy, whereas a PRB installed farther downgradient may be designed to protect human health or nearby ecological receptors. PRBs are frequently installed as trenches or a series of closely-spaced borings and can be composed of granular zero-valent iron, microorganism populations, HRC, an activated carbon source such as PlumeStop® Liquid Activated Carbon™ ("PlumeStop"), or as a combination of these components.

PlumeStop is an aqueous liquid composed of fine particles of activated carbon suspended in water and is injected into the subsurface as a colloidal suspension using conventional liquid-injection equipment. Dissolved-phase contaminants partition out of groundwater and into/onto the PlumeStop matrix resulting in a potentially rapid decrease in groundwater contaminant concentrations. The net rate of sorptive partitioning is due to the increased relative surface area of the colloidal particles (1-2 μm). The PlumeStop becomes saturated with the contaminants, concentrating them within its structure.

PlumeStop is generally co-applied with HRC and BDI Plus. Under favorable electron donor/acceptor and geochemical conditions, PlumeStop can be colonized by microbes enhancing biodegradation rates and efficiency. In this manner, PlumeStop provides both a growth-medium and a substrate source to support microbial growth while keeping the contaminants out of groundwater resulting in rapid dissolved contaminant concentration decrease (Weidemeier, 1998).

Calcium chloride ("CaCl") is often used as a parking solution for PlumeStop barriers when groundwater movement is above average. Upon contact with PlumeStop, CaCl binds several particles of the activated carbon together (10-20μm), slowing or stopping their movement through the aquifer increasing barrier placement and efficacy.

Applicability

The primary advantages of using a PlumeStop PRB with CaCl are similar to those described above for ISCR with bioaugmentation. In addition to the non-disruptive nature of utilizing PRBs, rapid dissolved contaminant decreases, and protection of down-gradient receptors are frequently observed.

The general disadvantages of this technology are the more significant initial cost and the need to monitor the aquifer geochemistry. Monitoring of conditions in and around PRBs should begin once installation is complete. The key lines of evidence targeted by a monitoring program includes cVOCs and their breakdown products, hydraulic flow characteristics through and around the PRB, and groundwater geochemistry. Together, these lines of evidence are considered indicators of PRB performance and longevity. PRBs with PlumeStop and CaCl followed by MNA is considered to be a viable combined technology for this Site. A successful ISCR pilot test combined with the PlumeStop injectant was completed at the Site, as provided in Section 3.2.9.

3.2.7 *Vapor Mitigation System*

Technology Description

There are several approaches to mitigate the VI pathway based primarily on building construction (e.g., existing, slab-on-grade, basement, crawl space). These vapor control technologies involve preventing infiltration of subsurface vapors into a building by application of a barrier, sub-slab venting and/or adjustments to the pressure differential between the subsurface and the interior of the building.

The type of VMS utilized is primarily determined by factors such as the use, construction and design of the building, the sub-slab soils, and if the building is existing or new. A subsurface depressurization system ("SSDS") is a common technology that applies a negative pressure field or vacuum beneath and/or around the building of concern, thereby preventing VI into the building. An SSDS utilizes a fan or blower to create a continuous negative pressure field (vacuum) below the slab.

A sub-membrane depressurization system ("SMDS") is typically used when a building has an earthen (or gravel, etc.) floor or crawlspace, as opposed to, or in addition to a slab. A membrane, such as a high-density polyethylene, is used to cover the earthen floor or crawlspace area. Similar to an SSDS, a negative pressure field is created beneath the membrane thereby preventing VI.

Applicability

Although an SSDS is designed to prohibit the movement of volatile contaminants from the soil into a building, this technology is not considered a remedial action of the dissolved contaminant plume. These systems, as well as their ongoing OMM are, however, considered part of the remedial strategy for the Site. The volume of contaminants removed by the VMS is incidental to the overall Site remediation and does not address source control. As a result, these systems by themselves are not considered capable of meeting RAOs. As discussed in Section 1.4, IA will be mitigated to RIASLs for residential structures without the continued operation of a VMS, or if necessary, the continued operation of a VMS with an institutional control that requires the operation of the VMS with periodic confirmation air sampling.

3.2.8 **Residual Soil Contamination Isolation**

Technology Description

As discussed in Sections 2.7.1 and 2.7.3, the sanitary sewer located southwest of the Site is a suspected release mechanism. Characterization activities have determined the sewer is 8" in diameter, and approximately 10 feet deep with multiple fractures and root locations. Results from the June 2019 soil and groundwater investigation provides supporting evidence that residual-phase cVOCs are present adjacent to and potentially under the fractured sewer line providing an on-going source for groundwater contamination. Sewer excavation and replacement was not considered a viable source removal option due to depth, native soil type, additional utility obstructions, and municipal service disruption, as discussed in Section 3.2.1. Alternatively, Wilcox evaluated residual source isolation utilizing trenchless sewer repair methods with cured-in-place pipe ("CIPP") technology to prevent on-going leaching.

The CIPP method can be applied to rehabilitate pipe lines with defects such as cracks, offset joints, rooting infiltrations, and structurally deficient segments. The thermosetting resin material bonds with the existing pipe materials to form a tighter seal than most other trenchless techniques. The two primary methods of installing CIPP are winch-in-place and invert-in-place. These methods are used during installation to feed the tube through the pipe. The winch-in-place method uses a winch to pull the tube through the existing pipeline. After being pulled through the pipeline, the tube is inflated to push the liner against the existing pipe walls. The more typically applied inversion-in-place method uses gravity and either water or air pressure to force the tube through the pipe and invert it. This process of inversion presses the resin- coated tube against the walls of the existing pipe. During both the winch-in-place and inversion-in-place methods, heat is then circulated through the tube to cure the resin to form a strong bond between the tube and the existing pipe.

Applicability

The primary disadvantage of using trenchless repair techniques is that the suspected residual leaching source remains adjacent to the sewer with the associated potential leaching and direct contact risk. Additionally, due to the depth to groundwater near the sewer, the depth of soil contamination, and the successful ISCR pilot test combined with the PlumeStop injectant, trenchless sewer repair combined with CIPP technology does not appear to be the most effective remedial option for the Site.

3.2.9 *Institutional Controls & Plume Behavior Demonstration*

Institutional controls such as an ERC can reduce potential risk by limiting or eliminating exposure pathways without reducing contaminant concentrations. An ERC, applied to a specific parcel(s) of property will limit how a property is used (e.g., for commercial or industrial purposes) and restrict specific activities on that property (e.g., no groundwater supply wells). Based on the CSM (**Figure 4**), a restriction prohibiting the future withdrawal of groundwater for potable purposes would eliminate the potential for future exposure via the direct-contact (ingestion) pathway. ERCs will be considered further upon completion of active remediation.

Characterizing the behavior of groundwater impacts is an alternative means of controlling exposure to groundwater contaminants by demonstrating that the contaminants will not reach a receptor. The RCG identifies numerous quantitative and qualitative LOEs that are pertinent to such demonstrations. LOEs that are potentially applicable to demonstrating plume behavior at the Site include, but are not limited to:

- Dissolved contaminant loss;
- Aquifer geochemistry evaluation;
- Groundwater time of travel;
- Variation in groundwater flow direction;
- Variation in groundwater elevation;
- Qualitative analysis; and,

- Plume trend analysis.

Based on the concentrations observed in groundwater, a plume-behavior demonstration may be a feasible approach to address the groundwater direct-contact exposure pathway. However, a successful plume behavior demonstration does not preclude the introduction of an additional receptor (i.e., new potable water wells) in the future. Therefore, remediation and/or institutional controls should be considered to reduce the risk of exposure.

3.2.10 *Pilot Test Description*

Wilcox and Regenesis Remediation Services ("Regenesis") completed an ISCR pilot test in July and August 2018 consisting of HRC, BDI Plus, PlumeStop, and CaCl injections. The pilot test consisted of a series of injection points in alleys near MW-09 and MW-10 at the locations depicted on **Figure 13**. Two rows of 16 injection points oriented north to south were positioned in the alley beginning at the MW-09/MW-9D location and extending north to the west-east adjacent alley. The injection points were staggered in an offset pattern on opposite sides of the alley. A third row of three injection points was positioned east of MW-10. A total of 400 lbs. of HRC, 18 liters of BDI, 4.067 lbs. of PlumeStop, and 2,000 lbs. of CaCl was injected across a seven-feet treatment interval (9-16 feet bgs) during the pilot test.

Baseline groundwater samples were collected prior to and 30-days after the pilot test from a subset of 12 monitoring wells positioned at optimal locations in order to evaluate pilot test performance. Pilot test data is summarized in **Table 13** and depicted on **Figure 14**. A summary of the pilot test evaluation follows:

- August 2018 PCE concentrations decreased from the July 2018 pre-injection concentrations at MW-09, MW-09D, MW-10, and MW-15. Of note, the PCE concentration at MW-09 decreased from 291 micrograms per liter (µg/L) in July 2018 to non-detect.
- A significant post-treatment decreasing DO trend was present at many of the performance wells. The pre-treatment DO concentrations at MW-09 and MW-10 were measured at 6.21 and 7.64 mg/L, respectively, and decreased to 0.00 mg/L post-treatment at each location. Decreases in DO were also reported at other performance wells during post-treatment sampling, except for MW-09D which increased from 0.71 mg/L to 2.74 mg/L. Similar decreases were reported for the oxidation-reduction-potential ("ORP") indicating reducing conditions favorable for reductive dechlorination.
- Decreased concentrations of the electron acceptors nitrate, Fe(III), and Mn(IV) were reported indicating sufficient reducing conditions to sustain dechlorinating reactions.

Overall, the groundwater analytical results for monitoring well MW-09 indicate that the pilot test was successful. The PCE concentration at MW-09, which since 2015 has ranged from 80.3 µg/L (May 2017) to 376 µg/L (September 2016), is currently below laboratory detection levels. Additionally, the pilot test injections have altered aquifer geochemistry creating a slightly more alkaline, more oxygen-poor reducing environment, which was expected and desired to stimulate anaerobic biodegradation. Additional details regarding pilot test activities and analysis are included in the Pilot Test Report in **Appendix P**. The Pilot Test is considered a success and Wilcox recommends proceeding with full-scale ISCR treatment.

3.3 Selected Remediation Technologies

The following technologies have been selected as components of the remediation strategy to prevent potential exposure:

- Soil chemical injection consisting of ISCR with HRC, bioaugmentation with BDI Plus, and PRBs with PlumeStop and CaCl;
- Institutional controls consisting of ERCs; and,
- A plume behavior demonstration.

3.3.1 ***Soil Chemical Injection***

The proposed soil chemical injection plan is designed as four PRBs consisting of approximately 228 injection points depicted on **Figure 15**. Injection spacing is based on the hydrogeologic conditions and plume dynamics. The geochemistry at nearby monitoring wells will be monitored during the injection. The use of direct push injection will provide flexibility based on field conditions and potential obstructions. A licensed injection contractor with the appropriate certificates, experience, and training will be subcontracted to complete the injections. The amendments will be injected in a bottom-up approach, with the amendments being injected into the deepest treatment interval first followed by the middle treatment interval and the shallowest interval. Flow meters will be used to measure the amount of injectant delivered into each interval. The Regenesis injection design is included in **Appendix Q**. Additional details are summarized below.

- Barrier A is positioned within the eastern portion of the groundwater plume, oriented in an "L-shape" configuration spanning approximately 200 feet along the northern right-of-way ("ROW") of East Washington Street east to west, and approximately 110 feet north-south across East Washington St. and along the eastern side of the alleyway adjacent to MW-16.

- Barrier B is located mid-plume approximately 120 feet north-south along the driveway to the 571 E. Washington Street residence.

- Barrier C is positioned along the western portion of the groundwater plume, oriented north to south approximately 170 ft along the eastern ROW of Pearl Street.

- Barrier D is located along the alley containing the sanitary sewer located southwest of the Site, oriented east to west approximately 160 feet from the eastern terminus of the pilot test area to the east side of N. Colfax Street.

The following tables summarize the injection design:

Injection Zone Details				
Injection Zone	**Barrier A**	**Barrier B**	**Barrier C**	**Barrier D**
Barrier Length (ft)	310	120	170	160
Spacing Within Barrier (ft)	10	10	10	10
Number of Lines	2	2	2	2
# of Application Points	93	36	51	48
Injection Depth Interval (ft bgs)	9-16	9-16	12-20	9-16

ISCR Application Design Summary				
Injection Zone	**Barrier A**	**Barrier B**	**Barrier C**	**Barrier D**
PlumeStop Application Points	62	24	34	32
PlumeStop to be Applied (lbs.)	14,000	4,000	6,000	7,200
PlumeStop to be Applied (gals.)	1,554	444	666	799
PlumeStop Total Application Volume (gals.)	20,978	11,987	17,981	10,789
PlumeStop per Point (gals.)	338	499	529	337
HRC and BDI Plus Application Points	31	12	17	16
HRC to be Applied (lbs.)	1,320	520	840	680
HRC per point (lbs.)	43	43	49	43
HRC Total Application Volume (gals.)	122	48	77	63
HRC per Point (gals.)	3.9	4.0	4.6	3.9
BDI Plus to be Applied (L)	19	8	12	10
BDI Plus per Point (L)	0.6	0.7	0.7	0.6

3.3.2 *Institutional Controls*

Draft ERC(s), if applicable and necessary, will be provided to IDEM for its review prior to finalizing. A draft ERC for the Site is provided in **Appendix R**. The possibility of executing an environmental restrictive ordinance ("ERO") was previously discussed with City of Martinsville personnel during an April 2017 meeting. The City of Martinsville was not receptive to adopting an ERO at that time.

3.3.3 *Plume Behavior Evaluation*

Up to eight quarters of post-remedy groundwater monitoring is proposed to generate a data set that is representative of seasonal fluctuations and will demonstrate contaminant concentration reductions from the proposed remedy. Upon completion of the eight-additional quarterly groundwater monitoring events, a multiple LOE plume behavior evaluation will be compiled and submitted to IDEM to demonstrate that the potential for direct ingestion of groundwater impacts is sufficiently remediated by the remedy and institutional controls (i.e. on-site ERC) for both current and future conditions. Should it be supported by the data collected, the plume behavior evaluation, and associated request for closure will be submitted prior to completion of the eight post-remediation quarterly groundwater sampling events.

3.4 Monitoring and Sampling Plan

Groundwater monitoring will be completed to track remedy performance. Additional baseline monitoring will be completed prior to implementation of the injection program. Results from the baseline sampling will represent the Site-wide baseline groundwater conditions. Process monitoring will be completed during the injection program to monitor the injection process, and post-injection monitoring will be completed to evaluate remedy effectiveness. Monitoring is further described in the following sections.

3.4.1 *Baseline Monitoring*

Monitoring wells MW-08, -09, -09D, -10, -11, -15, -15D, -16, -17, -19, -24, and -26 will be sampled prior to the start of the injection program. Each well is located within or adjacent to the treatment zone, and will be sampled for the following:

- Field parameters (DO, pH, ORP, temperature, specific conductance);
- VOCs;
- Dissolved gases: methane, ethane, ethene;
- Electron acceptors (nitrate, total iron, total manganese, and sulfate);
- Reduction byproducts (nitrite, dissolved iron, dissolved manganese, and sulfide);
- Total organic carbon ("TOC"); and,
- Alkalinity.

3.4.2 *Process Monitoring*

Specific parameters will be monitored from wells in the injection area during remedy implementation to evaluate the injection process. The parameters that will be measured include:

- DTW, turbidity, pH, ORP, and DO in the monitoring wells at the end of each injection day;
- A calibrated PID will be used to monitor the breathing zone for volatile hydrocarbons; and
- Methane monitoring (see Section 3.5 below).

3.4.3 *Post-Injection Monitoring*

Additional groundwater monitoring parameters are recommended to evaluate the efficacy of the reductive process. Performance monitoring will be completed at five intervals; 30, 90, 180, 270, and 360 days after injection. While most of these events will coincide with regular quarterly monitoring events, at least one performance monitoring event will be out of sync with regular sampling activities. Wilcox will collect the same parameters from the monitoring well subset utilized in the baseline monitoring described above in Section 3.4.1. ISCR performance evaluation will be included in the groundwater monitoring reports.

Groundwater monitoring results will be used to evaluate remedy performance, and ultimately, Site closure. The following performance metrics have been developed as guidelines to evaluate remedy progress and assess if contingency measures are needed to meet the stated objectives.

Performance Metrics One Year After Injections	Contingency After One Year
Reduction of <25% of PCE concentrations in performance monitoring wells.	Develop work plan and implement alternative treatment approach.
Reduction between 25% and 50% of PCE concentrations in performance monitoring wells.	Treatment approach considered to be appropriate and viable. Evaluate geochemical conditions and develop work plan for additional injections if needed to support continued biodegradation. Specifically, additional injections will be planned if aquifer conditions are no longer reducing and TOC < 20 mg/L.
Reduction of >50% of PCE concentrations in performance monitoring wells.	Treatment progressing at or above expectations, continue monitoring as needed.

Performance Metrics Two Years After Injections	Contingency After Two Years
Reduction of <75% of PCE concentrations in performance monitoring wells.	Develop work plan and implement alternative treatment approach.
Reduction between 75% and 90% of PCE concentrations in performance monitoring wells and no decreasing concentration trends for daughter products.	Treatment approach considered to be progressing, but below expectations. Develop work plan for additional injections or alternative treatment approach.
Reduction of >90% of PCE concentrations (or to concentrations below RAOs) with decreasing daughter product concentrations in performance monitoring wells.	Treatment progressing at or above expectations, continue monitoring as needed.

3.5 Methane Monitoring

The generation of methane is a desired condition for enhanced reductive dechlorination. The addition of PlumeStop, HRC, and BDI Plus into the subsurface may cause the production of limited amounts of methane, which is combustible and may pose a VI hazard to buildings in the vicinity of the treatment areas. In order to evaluate the potential associated hazards, Wilcox developed a methane monitoring plan in accordance with the August 2015 IDEM guidance[2]. The plan is summarized below:

1. *Groundwater Methane Monitoring*: As described above in Section 3.4.2, methane will be included in post-injection groundwater analysis. If methane groundwater concentrations exceed 10 mg/L, monitoring well headspace assessment will be completed as outlined below in Step 2. If groundwater samples are below 10 mg/L and exhibit a decreasing trend, methane monitoring will be discontinued.
2. *Monitoring Well Headspace Methane Monitoring*: The air within the monitoring well headspace will be assessed utilizing sealed well caps with dedicated vapor sampling ports and a flame ionization detector ("FID") if methane concentrations in a well exceeds 10 mg/L. Methane headspace monitoring will proceed monthly for a minimum of three months. If methane concentrations exceed 10% of the lower explosive limit ("LEL"), soil gas monitoring points will be installed and evaluated as indicated below in Step 3. If methane concentrations are observed below 10% of the LEL and exhibit a decreasing trend, headspace monitoring will be discontinued.
3. *Soil Gas Methane Monitoring:* If methane vapor concentrations exceed 10% of the LEL in well head space, a soil gas monitoring point will be installed between the well and the nearest occupied structure, and monthly methane monitoring will be completed for three months. If methane is observed in the soil gas point greater than 10% of the LEL, sub-slab monitoring will be completed as described in Step 4 below. If methane concentrations are observed below 10% of the LEL and exhibit a decreasing trend, soil gas monitoring will be discontinued.
4. *Sub-Slab Soil Gas Methane Monitoring:* Sub-slab soil gas ports will be installed through the slab of the nearest occupied structure after 10% of the LEL is reported. Monthly methane monitoring will be conducted for three months. If methane is detected in sub-slab soil gas at concentrations exceeding 10% of the LEL, a VMS will be evaluated and subsequently installed at the structure to mitigate exposure risk. If methane concentrations are observed below 10% of the LEL and exhibit a decreasing trend, methane evaluation will be discontinued.
5. *VMS Evaluation and Installation:* VMS technology will be evaluated and installed in structures with sub-slab methane concentrations exceeding 10% of the LEL. Appropriate precautions related to the combustible nature of methane will be assessed for safe VMS operations and effectiveness. Quarterly pressure field extension assessment will be completed to monitor VMS operation, and will continue until groundwater methane concentrations in the vicinity of the structure are below 10 mg/L for four consecutive quarters.

3.6 **Vinyl Chloride Evaluation**

The reductive dechlorination of PCE often results in the accumulation of VC rather than the non-hazardous end product ethene (Weidemeier, 1998). This may be caused by the absence of appropriate microorganisms, insufficient supply of donor substrate, or a combination of these factors. BDI Plus will be co-applied with PlumeStop and HRC during PRB installation. BDI Plus contains DHC and is engineered to stimulate the rapid and complete dichlorination of cVOCs from

[2] Addressing Methane at Anaerobic Bioremediation Sites, August 31, 2015

PCE to ethene. Therefore, VC is not anticipated to be generated at concentrations requiring additional contingency measures.

3.7 Sampling and Monitoring Frequency

As discussed in Section 3.4.3 above, post-injection groundwater monitoring will be completed at five intervals; 30, 90, 180, 270, and 360 days after injection, and on a quarterly basis after in accordance with the SAP included as an attachment to the QAPP included in **Appendix K**. The groundwater monitoring schedule is included in **Table 14**.

3.8 Project Work Schedule

Based on the data collected as of the date of this RWP report, completion of the remaining work is projected to be completed as follows herein, and more specifically on the project schedule included in **Table 15**. After each additional data collection, the schedule will be reviewed and revised as necessary. Any revisions will be provided to IDEM.

Task	Estimated Completion Date
Fourth Quarter 2019 Groundwater Monitoring	November 2019
Revised RWP Submitted to IDEM	November 2019
Winter VI	February 2020
First Quarter 2020 Groundwater Monitoring	February 2020
IDEM Approval of RWP	April to May 2020
Second Quarter 2020 Groundwater Monitoring	May 2020
RWP Implementation	May to July 2020
Third Quarter 2020 Groundwater Monitoring	August 2020
RWP Implementation Report Submitted to IDEM	August to September 2020
Fourth Quarter 2020 Groundwater Monitoring	November 2020
First Quarter 2021 Groundwater Monitoring	February 2021
Second Quarter 2021 Groundwater Monitoring	May 2021
Third Quarter 2021 Groundwater Monitoring	August 2021
Fourth Quarter 2021 Groundwater Monitoring	November 2021
First Quarter 2022 Groundwater Monitoring	February 2022
Second Quarter 2022 Groundwater Monitoring	May 2022
Final VI Confirmatory Assessment	August 2022
Preparation and Review of Completion Report and Request for NFA to IDEM	September 2022
IDEM Review of Completion Report and Request for NFA	December 2022 to January 2023
Monitoring Well Abandonment, VMS Decommissioning, ERC Filing	February 2023

3.9 Environmental Restrictive Covenant

Draft ERC(s), if applicable and necessary, will be provided to IDEM for review prior to finalizing. A Draft ERC for the Site is provided in **Appendix S**.

4.0 COMMUNITY RELATIONS

Previous community relationship efforts have included a public meeting for area residents, the City of Martinsville, and interested parties. The public meeting was held in April 2017 and facilitated by Wilcox staff, and included IDEM staff attendance. No future meetings are planned; however, if the need arises Wilcox will hold a public meeting prior to RWP implementation. Wilcox will coordinate with interested stake holders to address the comments and answer questions about the proposed remediation.

4.1 RWP Implementation Report

Following the completion of the remediation and confirmation sampling, Wilcox will submit an RWP Implementation Report to IDEM documenting the remediation activities discussed herein.

5.0 LIMITATIONS AND SIGNATURES

Wilcox Environmental Engineering's (Wilcox's) services, data, opinions, and recommendations described in this report are for Client's sole and exclusive use, and the unauthorized use of or reliance on the data, opinions, or recommendations expressed herein by parties other than Wilcox's Client is prohibited without Wilcox's express written consent. The services described herein are limited to the specific project, property, and dates of Wilcox's work. No part of Wilcox's report shall be relied upon by any party to represent conditions at other times or properties. Wilcox will accept no responsibility for damages suffered by third parties as a result of reliance upon the data, opinions, or recommendations in this report.

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Wilcox has striven to perform the services in a manner consistent with that level of care and skill ordinarily exercised by other environmental consultants practicing in the same locality and under similar conditions existing at the time we performed our services. **No other warranty is either expressed or implied in this report or any other document generated in the course of performing Wilcox's services.**

Jeremy S. Kinman, LPG, PG
Associate Technical Director

R. Scott Stoldt, CPG, LPG, PG
Director

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Indiana Map Viewer, http://maps.indiana.edu/.

Indiana Department of Environmental Management, Virtual File Cabinet (VFC), https://vfc.idem.in.gov/FacilitySearch.aspx.

United States Department of Agriculture, Web Soil Survey, https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

United States Fish & Wildlife Service, https://www.fws.gov/.

United States Fish & Wildlife Service, National Wetland Inventory, https://www.fws.gov/wetlands/.

Weidemeier, T.A. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, September 1998.

TABLES

Table 1. Virtual File Cabinet Records
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Document #	Date	Type	Format	Author	Title
32387495	7/11/1997	OLQ Field Inspections	Letter	IDEM	Letter of Status - HW Management Compliance Evaluation
53628215	11/13/2002	OAQ Field Inspections	Letter	IDEM	Enforcement Referral
37425756	1/1/2006	OAQ Field Inspections	Report	IDEM	Field Inspection Report
37425783	1/1/2006	OAQ Field Inspections - Compliance	Report	IDEM	Field Inspection Report
37425779	1/1/2006	OAQ Field Inspections - Compliance	Letter	IDEM	Request For Legal Action
37425778	1/1/2006	Correspondence	Letter	IDEM	Dry Cleaner Data Base Information
39641204	1/1/2008	OAQ Field Inspections - Compliance	Violation Letter/Report	IDEM	Inspection Summary/Violation Letter
30866055	6/20/2008	OLQ Authorization	Letter	IDEM	Hazardous Waste Handler Identification
55360621	4/15/2010	OAQ Field Inspections	Report	IDEM	Field Inspection Report
55359917	4/21/2010	OAQ Field Inspections - Compliance	Violation Letter/Report	IDEM	Inspection Summary/Violation Letter
80038799	5/13/2013	OLQ Authorization	Letter/Report	IDEM	Contained-in Determination for Contaminated Soil & Grounwater
70502827	10/29/2014	Enforcement	Letter/Report	IDEM	Special Notice of Potential Liability and Request for Information
70522252	11/6/2014	Enforcement	Report	USPS	Delivery Record
80018320	12/23/2014	Enforcement	Letter/E-Mail	Taft Law	Response to 10/29/14 letter
80013845	3/2/2015	Site Characterization	Report	Wilcox	Initial Site Investigation Report
80075088	5/5/2015	Inspection Summary	Letter	IDEM	Inspection Summary Letter
80060633	6/16/2015	Site Characterization	Report	Wilcox	Futher Site Investigation Report
80098891	8/4/2015	Site Characterization	Report Response	IDEM	Response to Further Site Investigation Report
80305788	6/6/2016	Site Characterization	Report	Wilcox	Further Site Investigaiton Report II
80342523	8/26/2016	Site Characterization	Report Response	IDEM	Response to Further Site Investigation Report II
80384262	11/18/2016	Monitoring Report	Report	Wilcox	Site Status Update
80440316	3/24/2018	Site Characterization	Letter	IDEM	Access Request for Site Investigation
80440701	3/24/2018	Site Characterization	Letter	IDEM	Access Request for Site Investigation
80440702	3/24/2018	Site Characterization	Letter	IDEM	Access Request for Site Investigation
80440704	3/24/2018	Site Characterization	Letter	IDEM	Access Request for Site Investigation
80440732	3/24/2018	Site Characterization	Letter	IDEM	Access Request for Site Investigation
80456408	5/4/2017	Site Characterization	Report	Wilcox	2017 Winter Vapor Intrusion Sampling
80467537	5/24/2017	Site Characterization	Report	Wilcox	2017 Winter Vapor Intrusion Sampling Update
80465635	5/25/2017	OLQ Authorization	Report Response	IDEM	Contaminated Groundwater and Soil Response
80471727	6/7/2017	Site Characterization	Email	IDEM	IDEM Comments on Winter 2017 VI Sampling Update
80515957	9/5/2017	OLQ Authorization	Email/Report	IDEM	Contained-in Determination for Contaminated Soil
80528401	9/26/2017	Monitoring Report	Report	Wilcox	Quarterly Monitoring Report, Second Quarter 2017
80540198	10/16/2017	Monitoring Report	Report	Wilcox	2017 Summer Vapor Intrusion Sampling Update
80553758	11/1/2017	Monitoring Report	Report	Wilcox	Quarterly Monitoring Report, Third Quarter 2017
80562618	11/20/2017	Site Characterization	Email	IDEM	IDEM Comments on Summer 2017 VI Sampling Update
80573635	12/11/2017	Site Characterization	Report	Wilcox	Further Site Investigation III Report
80599976	1/22/2018	Site Characterization	Report Response	IDEM	Response to Further Site Investigation Report III
80638032	3/26/2018	Monitoring Report	Report	Wilcox	Quarterly Monitoring Report, Fourth Quarter 2017
82568160	6/21/2018	Site Characterization	Report	Wilcox	2018 Winter Vapor Intrusion Sampling and Diagnostic Testing
82602059	8/22/2018	Site Characterization	Email	IDEM	Response to RWP Time Extension and 2018 Winter VI
82605551	8/27/2018	Monitoring Report	Report	Wilcox	GW Sampling Update – First & Second Quarter 2018
82618175	9/14/2018	Site Characterization	Report	Wilcox	VMS System Install and 30-Day Post Sampling Report
82625428	9/28/2018	Site Characterization	Report	Wilcox	2018 Summer Vapor Intrusion Sampling Update - 659 East Washington Street
82630845	10/10/2018	Technical Review	Letter	IDEM	IDEM Chemistry Services Section review of the vapor samples collected at 659 East Washington Street.
82679385	1/7/2019	Remediation	Report	Wilcox	Remediation Work Plan
82710564	2/26/2019	Monitoring Report	Report	Wilcox	GW Sampling Update – Third & Fourth Quarter 2018
82786255	6/3/2019	OLQ Authorization	Email/Report	IDEM	Contained-in Determination for Contaminated Groundwater
82790468	6/10/2019	Remediation	Email/Letter	IDEM	IDEM Comments on the Remediation Work Plan
82834633	9/4/2019	Monitoring Report	Report	Wilcox	GW Sampling Update - First & Second Quarter 2019

Notes:
IDEM = Indiana Department of Environmental Management
OAQ = Office of Air Quality
OLQ = Office of Land Quality
VI = Vapor Intrusion
GW = Groundwater

Table 2. Cumulative Grab Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Date Sampled	Sample Type	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels			**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels			110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels			*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
B-04	01/20/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
	01/20/2015	FD	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
B-05	01/20/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	6.8	< 5.0	< 5.0	251
B-06	03/18/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-07	03/18/2015	N	**7.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-08	03/18/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	48.6	< 5.0	< 5.0	< 100
	03/18/2015	FD	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	**5.9**	53.6	< 5.0	< 5.0	< 100
B-09	09/25/2015	N	**129**	< 5.0	10.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-10	09/25/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-11	09/25/2015	N	**178**	< 5.0	8.6	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
	09/25/2015	FD	**228**	< 5.0	13.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-12	12/14/2015	FG	0	0	0	0	***52.4***	NA	NA	NA	NA	NA
B-13	12/14/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
	12/14/2015	FG	0	0	0	0	**20.4**	NA	NA	NA	NA	NA
B-14	12/14/2015	FG	0	0	0	0	***51.8***	NA	NA	NA	NA	NA
B-15	12/14/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
	12/14/2015	FG	0	0	0	0	**32.9**	NA	NA	NA	NA	NA
B-16	12/14/2015	FG	0	0	0	0	0	NA	NA	NA	NA	NA
B-17	12/14/2015	FG	**156**	0	23.2	0	0	NA	NA	NA	NA	NA
B-18	12/14/2015	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
	12/14/2015	FG	0	0	0	0	***35.0***	NA	NA	NA	NA	NA
B-19	12/15/2015	FG	0	0	0	0	0	NA	NA	NA	NA	NA
B-20	12/15/2015	FG	2.0	0	0	0	**22.4**	NA	NA	NA	NA	NA
B-21	12/15/2015	FG	**88.9**	0	0	0	**27.2**	NA	NA	NA	NA	NA
B-22	12/15/2015	FG	0	0	0	0	0	NA	NA	NA	NA	NA
B-23	12/15/2015	FG	**424**	0	0	0	***43.6***	NA	NA	NA	NA	NA
B-24	12/15/2015	FG	**25.6**	0	27.8	0	**27.4**	NA	NA	NA	NA	NA
B-25	12/15/2015	FG	**388**	0	0	0	***50.5***	NA	NA	NA	NA	NA
B-26	12/15/2015	FG	**22.2**	0	0	0	**26.5**	NA	NA	NA	NA	NA
B-27	12/15/2015	FG	0	0	0	0	0	NA	NA	NA	NA	NA
B-28	12/15/2015	FG	**41.6**	0	0	0	***47.1***	NA	NA	NA	NA	NA
B-29	12/15/2015	FG	0	0	0	0	0	NA	NA	NA	NA	NA
B-30	12/15/2015	FG	**235.8**	0	0	0	**12.4**	NA	NA	NA	NA	NA
B-31	12/15/2015	FG	0	2.8	0	0	0	NA	NA	NA	NA	NA
B-32	12/15/2015	FG	0	0.2	0	0	**16.0**	NA	NA	NA	NA	NA

Table 2. Cumulative Grab Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Date Sampled	Sample Type	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels			**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels			110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels			*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
B-33	12/15/2015	FG	**234**	0	0	0	**30.1**	NA	NA	NA	NA	NA
B-34	12/15/2015	FG	0	0	0	0	0	NA	NA	NA	NA	NA
B-35	12/15/2015	FG	**36.7**	0	0	0	**16.6**	NA	NA	NA	NA	NA
B-36	12/15/2015	FG	**61.6**	0	0	0	**30.0**	NA	NA	NA	NA	NA
B-37	01/07/2016	N	**16.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-38	01/07/2016	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-39	01/07/2016	N	**104**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-40	01/07/2016	N	**5.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-41	01/07/2016	N	**12.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-42	01/07/2016	N	**9.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-43	01/07/2016	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-44	01/07/2016	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-48	8/18/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-51	8/18/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-52	8/18/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-53	8/18/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-54	8/21/2017	FG	0	0	0	7.74	NA	NA	NA	NA	NA	NA
B-55	8/21/2017	FG	0	0	0	6.62	NA	NA	NA	NA	NA	NA
B-56	8/21/2017	FG	0	0	0	6.86	NA	NA	NA	NA	NA	NA
B-57	8/21/2017	FG	0	0	0	5.24	NA	NA	NA	NA	NA	NA
B-58	8/21/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-59	8/21/2017	FG	0	0	0	6.49	NA	NA	NA	NA	NA	NA
B-60	8/21/2017	FG	0	0	0	5.59	NA	NA	NA	NA	NA	NA
B-61	8/21/2017	FG	0	0	0	3.66	NA	NA	NA	NA	NA	NA
B-62	8/21/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-63	8/21/2017	FG	0	0	0	3.29	NA	NA	NA	NA	NA	NA
B-64	8/22/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-65	8/22/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-66	8/22/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-67	8/22/2017	FG	0	0	0	0	NA	NA	NA	NA	NA	NA
B-68	06/06/2019	N	**16.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-69	06/06/2019	N	**31.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-70	06/06/2019	N	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-71	06/06/2019	N	**64.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
	06/06/2019	FD	**68.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-72	06/06/2019	N	**104**	< 5.0	6.8	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-73	06/06/2019	N	**124**	< 5.0	12.4	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-74	06/06/2019	N	**186**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 2. Cumulative Grab Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Date Sampled	Sample Type	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels			**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels			110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels			*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
B-75	06/06/2019	N	**52.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Notes:
N = Normal Field Sample
FD = Field Duplicate Sample
FG = FROG 2000/4000 Sample
NA = Not Applicable
NE = Not Established
µg/L = micrograms per liter
< = Analyte not detected at the specified detection level
Screening levels obtained from IDEM's Remediation Closure Guide (RCG) Table A-6, March 22, 2012, updated March 2019
Bold values exceed IDEM RCG Residential Groundwater Tap Screening Levels
Underlined values exceed IDEM RCG Residential Vapor Intrusion Groundwater Screening Levels
Italicized values exceed IDEM RCG Commercial/Industrial Vapor Intrusion Groundwater Screening Levels

Table 3: Access Request and Vapor Intrusion Status Summary
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Property Address	Owner	Property Type	Date Access Agreement and Initial Informational Packet Mailed	Certified Mail Receipt	Date Second Access Agreement Mailed	Certified Mail Receipt	Date Third Access Agreement Hand Delivered	Date IDEM Access Request Mailed	Access Request Approval/Denial Status	Vapor Intrusion Status			
										First Winter VI Event	Second Winter VI Event	First Summer VI Event	Second Summer VI Event
40 North Colfax Street	Juanita Edwards Trust, 40 North Colfax Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0210	N/A	N/A	N/A	N/A	Access agreement executed 1/28/2017.	3/24/2017	N/A	8/31/2017	N/A
660 East Jackson Street	Arlington Investments, LLC, P.O. Box 1807, Martinsville, IN 46151	Residential rental	5/16/2017	7014 2120 0002 1419 0121	N/A	N/A	N/A	N/A	Access agreement executed 6/12/2017.	3/6/2018	N/A	9/12/2017	N/A
39 South Ohio Street	Michele L Suter, 39 South Ohio Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0562	8/23/2017	7014 1820 0001 2188 0364	N/A	N/A	Access agreement executed 8/26/2017.	3/8/2018	N/A	9/26/2017	N/A
40 South Ohio Street	Jeanne D Frye, 389 East Morgan Street, Martinsville, IN 46151	Residential rental	7/28/2017	7014 1820 0001 2188 0548	8/16/2017	7014 1820 0001 2188 0371	N/A	N/A	Access agreement executed 8/21/2017.	3/9/2018	N/A	9-6-17[1]	N/A
59 South Ohio Street	Jackson and Debra Davis, 59 South Ohio Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0531	N/A	N/A	N/A	N/A	Access agreement executed 8/9/2017.	Unresponsive to VI sample collection scheduling requests.			
60 South Ohio Street	Andrew and Anne Kominowski, 60 South Ohio Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0517	N/A	N/A	N/A	N/A	Access agreement executed 7/31/2017.	3/5/2018	N/A	9/6/2017	N/A
89 South Ohio Street	John and Shirley Basham, 89 South Ohio Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0524	N/A	N/A	N/A	N/A	Access agreement executed 8/1/2017.	3/15/2018	N/A	9/12/2017	N/A
90 South Ohio Street	Richard and Marilyn Hornberger, 90 South Ohio Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0555	N/A	N/A	N/A	N/A	Access agreement executed 7/31/2017.	3/6/2018	N/A	9/11/2017	N/A
409 East Washington Street	Garrett C Malone, 409 East Washington Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0388	N/A	N/A	N/A	N/A	Denied access 7/31/2017.				
445 East Washington Street	Larry and Carolyn Curtis, 445 East Washington Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0586	N/A	N/A	N/A	N/A	Denied access 7/31/2017.				
539 East Washington Street	Kennith Costin, 539 East Washington Street, Martinsville, IN 46151	Commercial	7/18/2016	7015 0640 0007 8483 7550	1/25/2017	Missing Receipt	2/27/2017	N/A	Denied access 7/30/2017.				
560 East Washington Street	Jonathon Carter and Robert Conyers, 560 East Washington Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0579	8/16/2017	7014 1820 0001 2188 2849	N/A	N/A	Access agreement executed 8/20/2017.	Unresponsive to VI sample collection scheduling requests.			
571 East Washington Street	Lou Modesitt, 571 East Washington Street, Martinsville, IN 46151	Residential	7/26/2016	7014 1820 0001 2188 0227	8/25/2016	Missing Receipt	2/27/2017	3/24/2017	Access agreement executed 6/11/2017.	Unresponsive to VI sample collection scheduling requests.			
590 East Washington Street	Angie Dipert, 590 East Washington Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0395	8/16/2017	7014 1820 0001 2188 2856	N/A	N/A	Access agreement executed 8/18/2017.	Unresponsive to VI sample collection scheduling requests.			
605 East Washington Street	Judith Ford, 605 East Washington Street, Martinsville, IN 46151	Residential	7/28/2017	7014 1820 0001 2188 0432	8/16/2017	7014 1820 0001 2188 2863	N/A	N/A	Denied access 8/29/2017.				
625 East Washington Street	Timothy Dunbar, 5085 West Big Hurricane Road, Martinsville, IN 46151	Residential rental	1/25/2017	7014 1820 0001 2188 0234	2/16/2017	7014 1820 0001 2188 5413	2/27/2017	3/24/2017	Access agreement executed 3/22/2017.	Unresponsive to VI sample collection scheduling requests.			
639 East Washington Street	Michael and Charlene Emerson, 639 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0241	2/16/2017	7014 1820 0001 2188 5406	2/27/2017	3/24/2017	Denied access 2/25/2017.				
640 East Washington Street	Roy and Amanda Rapp, 640 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0258	2/16/2017	7014 2120 0002 1419 0572	2/27/2017	N/A	No contact established. No response received.				

Table 3: Access Request and Vapor Intrusion Status Summary
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Property Address	Owner	Property Type	Date Access Agreement and Initial Informational Packet Mailed	Certified Mail Receipt	Date Second Access Agreement Mailed	Certified Mail Receipt	Date Third Access Agreement Hand Delivered	Date IDEM Access Request Mailed	Access Request Approval/Denial Status	Vapor Intrusion Status			
										First Winter VI Event	Second Winter VI Event	First Summer VI Event	Second Summer VI Event
659 East Washington Street	Steven and Rebecca Sonnega, 659 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0265	N/A	N/A	N/A	N/A	Access agreement executed 1/29/2017.	3/24/2017	N/A	8/28/2018	N/A
	Michael and Lori Feaster - owners as of 8/22/2017	Residential	6/5/2018	9114 9014 9645 1118 1773 71	N/A	N/A	N/A	N/A	Access agreement executed 7/30/2018.				
660 East Washington Street	Kari Palma, 660 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0272	2/16/2017	Missing Receipt	2/27/2017	N/A	Access agreement executed 6/12/2017.	Unresponsive to VI sample collection scheduling requests.			
689 East Washington Street	Marcia and Tera Miles, 689 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	Missing Receipt	2/16/2017	7014 2120 0002 1419 0558	2/27/2017	3/24/2017	Denied access 3/1/2017.				
690 East Washington Street	Michael Gaudzels, 690 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	Missing Receipt	2/16/2017	7014 2120 0002 1419 0541	2/27/2017	3/24/2017	Denied access 2/22/2017.				
700 East Washington Street	Laura Eckart, 700 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0302	2/16/2017	7014 2120 0002 1419 0534	2/27/2017	N/A	Denied access 2/12/2019.				
709 East Washington Street	Richard and Victoria Kivett, 709 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0425	2/16/2017	7014 1820 0001 2188 2870	2/27/2017	N/A	Denied access 9/24/2017.				
710 East Washington Street	Thomas and Vickie Head, 710 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7015 0640 0007 8483 7512	2/16/2017	7014 2120 0002 1419 0527	2/27/2017	N/A	Denied access 2/12/2019.				
739 East Washington Street	Daniel L Baldwin, 739 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0418	2/16/2017	7014 1820 0001 2188 2887	2/27/2017	N/A	No contact established. No response received.				
740 East Washington Street	Karen Louise Smith Trust, 740 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7015 0640 0007 8483 7529	N/A	N/A	N/A	N/A	Access agreement executed 1/30/2017.	3/24/2017	N/A	8/31/2017	5/15/2018[2]
759 East Washington Street	Mark and Joanne Stuttgen, 759 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7014 1820 0001 2188 0401	N/A	N/A	N/A	N/A	Access agreement executed 8/4/2017.	3/15/2018	N/A	9/12/2017	N/A
760 East Washington Street	Mark and Lyna Chaplin, 760 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7015 0640 0007 8483 7536	2/16/2017	7014 2120 0002 1419 0510	N/A	N/A	Access agreement executed 2/11/2017.	3/24/2017	3/15/2018	8/31/2017	N/A
790 East Washington Street	Sandra Long, 790 East Washington Street, Martinsville, IN 46151	Residential	1/25/2017	7015 0640 0007 8483 7543	2/16/2017	7014 2120 0002 1419 0503	2/27/2017	N/A	No contact established. No response received.				

= Access Granted

= Access Not Granted Nor Denied. Attempts At Access Discontinued Per IDEM's November 13, 2015 Waste-0065-NPD

= Access Denied

= Non-Compliant VI Sampling Results

= Compliant VI Sampling Results

[1]TCE indoor air exceedance with no corresponding sub-slab result attributed to indoor air source.

[2]VI Event Represents the 30-Day Post-VMS Installation Confirmatory Sampling Event.

Table 4. Chemicals of Concern and Screening Levels
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Chemical		Soil Exposure			Ground Water		Vapor Exposure			
		Direct Contact			Soil MTG	Tap	Ground Water		Indoor Air	
		Residential	Com/Ind	Excavation	Residential	Residential	Residential	Com/Industrial	Residential	Com/Ind
Name	CASRN	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(ug/L)	(ug/L)	(ug/m^3)	(ug/m^3)
Tetrachloroethene	127-18-4	110	170	170	0.045	5	110	470	42	180
Trichloroethene	79-01-6	5.7	19	95	0.036	5	9.1	38	2.1	8.8
Dichloroethene, 1,2-cis-	156-59-2	220	2300	2400	0.41	70	NE	NE	NE	NE
Dichloroethene, 1,2-trans-	156-60-5	1900	1900	1900	0.62	100	NE	NE	NE	NE
Vinyl Chloride	75-01-4	0.83	17	1300	0.014	2	2.1	35	1.7	28

C = Carcinogenic endpoint
CASRN = Chemical Abstracts Service Reference Number
mg/kg = milligrams per kilogram
MTG = Migration to ground water
NE= Not Established
ug/L = micrograms per liter
ug/m^3 = micrograms per cubic meter

Table 5. Monitoring Well Network Details
O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Well ID	TOC Elevation (ft)	Screen Interval (feet)	Diameter (inches)	Total Depth (feet)
MW-01	611.74	6-16	2	16
MW-02	613.15	6-16	2	16
MW-03	612.33	6-16	2	16
MW-04	611.47	6-16	2	16
MW-05	611.77	6-16	2	16
MW-06	610.86	6-16	2	16
MW-07	610.35	6-16	2	16
MW-08	610.86	6-16	2	16
MW-09	610.81	6-16	2	16
MW-09D	610.89	32.5-37.5	2	50
MW-10	611.20	6-16	2	16
MW-11	610.80	6-16	2	16
MW-12	609.76	6-16	2	16
MW-13	609.32	6-16	2	16
MW-14	608.05	6-16	2	16
MW-15	608.10	6-16	2	16
MW-15D	608.19	30-35	2	61
MW-16	608.88	6-16	2	16
MW-17	607.51	6-16	2	16
MW-18	606.47	10-20	2	20
MW-19	607.88	10-20	2	20
MW-20	605.75	10-20	2	20
MW-21	604.80	10-20	2	20
MW-22	606.94	10-20	2	20
MW-23	607.11	10-20	2	20
MW-24	607.95	10-20	2	20
MW-25	610.37	10-20	2	20
MW-26	607.37	7-17	2	20
MW-27	607.07	10-20	2	20
MW-28	607.31	10-20	2	20
MW-29	608.26	10-20	2	20
NPL-MW-04B	603.54	89-99	2	99
NPL-MW-04M	603.64	50-60	2	60
NPL-MW-04S	603.42	8-18	2	18
NPL-MW-28S	603.83	11-21	2	21
NPL-MW-29S	603.98	13-23	2	23
NPL-MW-32S	603.75	10.5-20.5	2	20.5
NPL-MW-34S	603.67	13-23	2	23
NPL-MW-35S	604.08	11-21	2	21
NPL-MW-36S	605.14	13-23	2	23

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
MW-01	6-16	98.57	01/23/2015	10.90	87.67
			01/23/2015	10.90	87.67
			04/21/2015	9.93	88.64
			09/28/2015	9.88	88.69
		611.74	02/04/2016	11.02	600.72
			09/14/2016	10.34	601.40
			09/14/2016	10.34	601.40
			11/22/2016	11.12	600.62
			02/03/2017	10.71	601.03
			05/03/2017	10.05	601.69
			09/19/2017	10.10	601.64
			12/06/2017	10.87	600.87
			03/21/2018	9.97	601.77
			05/30/2018	8.94	602.80
			08/29/2018	10.22	601.52
			11/26/2018	10.55	601.19
			02/19/2019	8.27	603.47
			05/20/2019	7.67	604.07
MW-02	6-16	99.99	01/23/2015	12.10	87.89
			04/06/2015	11.48	88.51
			09/28/2015	11.02	88.97
		613.15	02/04/2016	12.25	600.90
			09/12/2016	11.55	601.60
			11/21/2016	12.41	600.74
			02/01/2017	11.89	601.26
			05/02/2017	11.35	601.80
			09/18/2017	11.26	601.89
			12/05/2017	12.20	600.95
			03/19/2018	11.10	602.05
			05/29/2018	9.98	603.17
			08/27/2018	11.42	601.73
			11/26/2018	11.75	601.40
			02/19/2019	9.40	603.75
			05/20/2019	8.70	604.45
MW-03	6-16	99.14	01/23/2015	11.10	88.04
			04/06/2015	10.47	88.67
			09/28/2015	10.05	89.09
		612.33	02/04/2016	11.25	601.08
			09/13/2016	10.54	601.79
			11/21/2016	11.32	601.01
			02/02/2017	10.91	601.42
			05/03/2017	10.27	602.06
			09/18/2017	10.27	602.06
			12/05/2017	11.20	601.13
			03/19/2018	10.15	602.18
			05/29/2018	9.06	603.27
			08/28/2018	10.40	-10.40
			11/26/2018	10.74	601.59
			02/19/2019	8.43	603.90
			05/20/2019	7.79	604.54
MW-04	6-16	98.32	04/06/2015	10.15	88.17
			09/28/2015	9.78	88.54
		611.47	02/04/2016	10.93	600.54
			09/14/2016	10.26	601.21
			11/22/2016	NA	NA
			02/03/2017	10.60	600.87
			05/03/2017	9.91	601.56
			09/19/2017	10.00	601.47
			12/06/2017	11.03	600.44
			03/20/2018	9.87	601.60
			05/30/2018	8.85	602.62
			08/29/2018	10.11	601.36
			11/26/2018	10.44	601.03
			02/19/2019	8.16	603.31
			05/20/2019	7.62	603.85
MW-05	6-16	98.60	04/06/2015	10.12	88.48
			04/06/2015	10.12	88.48
			09/28/2015	9.77	88.83
		611.77	02/04/2016	10.90	600.87
			09/12/2016	10.19	601.58
			11/21/2016	10.97	600.80
			02/02/2017	10.55	601.22
			05/03/2017	9.87	601.90
			09/18/2017	9.98	601.79
			12/05/2017	10.83	600.94
			03/19/2018	9.85	601.92
			05/30/2018	8.84	602.93
			08/28/2018	10.08	601.69
			11/26/2018	10.41	601.36
			02/19/2019	8.18	603.59
			05/20/2019	7.64	604.13

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
MW-06	6-16	97.56	04/06/2015	10.10	87.46
MW-06	6-16	97.56	09/28/2015	9.66	87.90
MW-06	6-16	97.56	09/28/2015	9.66	87.90
MW-06	6-16	610.86	02/04/2016	10.82	600.04
MW-06	6-16	610.86	09/14/2016	10.13	600.73
MW-06	6-16	610.86	11/23/2016	10.94	599.92
MW-06	6-16	610.86	02/03/2017	10.50	600.36
MW-06	6-16	610.86	05/04/2017	9.66	601.20
MW-06	6-16	610.86	09/20/2017	9.89	600.97
MW-06	6-16	610.86	12/07/2017	10.77	600.09
MW-06	6-16	610.86	03/21/2018	9.70	601.16
MW-06	6-16	610.86	05/31/2018	8.75	602.11
MW-06	6-16	610.86	08/30/2018	10.02	600.84
MW-06	6-16	610.86	11/26/2018	10.34	600.52
MW-06	6-16	610.86	02/19/2019	8.11	602.75
MW-06	6-16	610.86	05/20/2019	6.44	604.42
MW-07	6-16	97.03	09/28/2015	9.51	87.52
MW-07	6-16	610.35	02/04/2016	10.64	599.71
MW-07	6-16	610.35	09/13/2016	9.94	600.41
MW-07	6-16	610.35	11/22/2016	10.69	599.66
MW-07	6-16	610.35	02/02/2017	10.20	600.15
MW-07	6-16	610.35	05/03/2017	9.64	600.71
MW-07	6-16	610.35	09/18/2017	9.70	600.65
MW-07	6-16	610.35	12/05/2017	10.60	599.75
MW-07	6-16	610.35	03/19/2018	9.55	600.80
MW-07	6-16	610.35	05/30/2018	8.60	601.75
MW-07	6-16	610.35	08/28/2018	9.84	600.51
MW-07	6-16	610.35	11/26/2018	10.16	600.19
MW-07	6-16	610.35	02/19/2019	7.93	602.42
MW-07	6-16	610.35	05/20/2019	7.36	602.99
MW-08	6-16	97.52	09/28/2015	9.95	87.57
MW-08	6-16	610.86	02/04/2016	11.16	599.70
MW-08	6-16	610.86	09/14/2016	10.41	600.45
MW-08	6-16	610.86	09/14/2016	10.41	600.45
MW-08	6-16	610.86	11/23/2016	11.17	599.69
MW-08	6-16	610.86	02/03/2017	10.72	600.14
MW-08	6-16	610.86	05/03/2017	10.15	600.71
MW-08	6-16	610.86	09/19/2017	10.15	600.71
MW-08	6-16	610.86	12/07/2017	10.71	600.15
MW-08	6-16	610.86	03/21/2018	9.99	600.87
MW-08	6-16	610.86	05/31/2018	9.04	601.82
MW-08	6-16	610.86	08/28/2018	10.30	600.56
MW-08	6-16	610.86	11/26/2018	10.62	600.24
MW-08	6-16	610.86	02/19/2019	8.37	602.49
MW-08	6-16	610.86	05/20/2019	7.75	603.11
MW-09	6-16	97.48	09/28/2015	10.77	86.71
MW-09	6-16	610.81	02/04/2016	11.96	598.85
MW-09	6-16	610.81	09/14/2016	11.26	599.55
MW-09	6-16	610.81	11/23/2016	12.00	598.81
MW-09	6-16	610.81	11/23/2016	12.00	598.81
MW-09	6-16	610.81	02/03/2017	11.61	599.20
MW-09	6-16	610.81	02/03/2017	11.61	599.20
MW-09	6-16	610.81	05/04/2017	11.05	599.76
MW-09	6-16	610.81	09/20/2017	10.96	599.85
MW-09	6-16	610.81	12/07/2017	11.56	599.25
MW-09	6-16	610.81	03/21/2018	10.88	599.93
MW-09	6-16	610.81	05/31/2018	9.82	600.99
MW-09	6-16	610.81	08/29/2018	11.15	599.66
MW-09	6-16	610.81	11/26/2018	11.43	599.38
MW-09	6-16	610.81	02/19/2019	9.21	601.60
MW-09	6-16	610.81	05/20/2019	8.53	602.28
MW-09D	32.5-37.5	610.89	09/20/2017	11.10	599.79
MW-09D	32.5-37.5	610.89	12/07/2017	11.85	599.04
MW-09D	32.5-37.5	610.89	03/21/2018	11.02	599.87
MW-09D	32.5-37.5	610.89	05/31/2018	9.99	600.90
MW-09D	32.5-37.5	610.89	08/29/2018	11.30	599.59
MW-09D	32.5-37.5	610.89	11/26/2018	11.58	599.31
MW-09D	32.5-37.5	610.89	02/19/2019	9.35	601.54
MW-09D	32.5-37.5	610.89	05/20/2019	8.70	602.19
MW-10	6-16	97.88	09/28/2015	10.95	86.93
MW-10	6-16	611.20	02/04/2016	12.19	599.01
MW-10	6-16	611.20	09/14/2016	11.49	599.71
MW-10	6-16	611.20	11/22/2016	12.21	598.99
MW-10	6-16	611.20	02/02/2017	11.83	599.37
MW-10	6-16	611.20	05/03/2017	11.34	599.86
MW-10	6-16	611.20	09/19/2017	11.16	600.04
MW-10	6-16	611.20	12/07/2017	11.92	599.28
MW-10	6-16	611.20	03/21/2018	11.03	600.17
MW-10	6-16	611.20	05/31/2018	9.99	601.21
MW-10	6-16	611.20	08/28/2018	11.39	599.81
MW-10	6-16	611.20	11/26/2018	11.68	599.52
MW-10	6-16	611.20	02/19/2019	9.45	601.75
MW-10	6-16	611.20	05/20/2019	8.77	602.43

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
MW-11	6-16	610.80	02/04/2016	12.71	598.09
			09/13/2016	11.95	598.85
			11/21/2016	12.70	598.10
			02/02/2017	12.35	598.45
			05/03/2017	11.88	598.92
			09/18/2017	11.64	599.16
			12/05/2017	12.65	598.15
			03/19/2018	11.49	599.31
			05/30/2018	10.40	600.40
			08/28/2018	11.90	598.90
			11/26/2018	12.20	598.60
			02/19/2019	9.95	600.85
			05/20/2019	9.16	601.64
MW-12	6-16	609.76	02/04/2016	10.26	599.50
			09/14/2016	9.63	600.13
			11/22/2016	11.37	598.39
			02/02/2017	9.91	599.85
			05/03/2017	9.17	600.59
			09/18/2017	9.40	600.36
			12/05/2017	10.28	599.48
			03/19/2018	9.26	600.50
			05/30/2018	8.32	601.44
			08/28/2018	9.52	600.24
			11/26/2018	9.82	599.94
			02/19/2019	7.64	602.12
			05/20/2019	7.16	602.60
MW-13	6-16	609.32	02/04/2016	10.90	598.42
			09/13/2016	10.19	599.13
			11/22/2016	10.94	598.38
			02/02/2017	10.50	598.82
			05/03/2017	9.85	599.47
			09/19/2017	9.95	599.37
			12/07/2017	10.90	598.42
			03/20/2018	9.85	599.47
			05/30/2018	8.85	600.47
			08/29/2018	10.11	599.21
			11/26/2018	10.41	598.91
			02/19/2019	8.22	601.10
			05/20/2019	7.66	601.66
MW-14	6-16	608.05	02/05/2016	10.62	597.43
			09/13/2016	9.90	598.15
			11/22/2016	10.66	597.39
			02/02/2017	10.26	597.79
			05/03/2017	9.67	598.38
			09/19/2017	9.66	598.39
			12/06/2017	10.55	597.50
			03/20/2018	9.59	598.46
			05/30/2018	8.50	599.55
			08/29/2018	9.88	598.17
			11/26/2018	10.16	597.89
			02/19/2019	7.97	600.08
			05/20/2019	7.35	600.70
MW-15	6-16	608.10	02/05/2016	10.72	597.38
			09/14/2016	10.06	598.04
			11/23/2016	10.78	597.32
			02/03/2017	10.40	597.70
			05/04/2017	9.70	598.40
			05/04/2017	9.70	598.40
			09/20/2017	9.72	598.38
			09/20/2017	9.72	598.38
			12/07/2017	10.71	597.39
			03/21/2018	10.66	597.44
			05/31/2018	9.00	599.10
			07/29/2019	9.99	598.11
			11/26/2018	10.27	597.83
			02/19/2019	8.05	600.05
			05/20/2019	7.40	600.70
MW-15D	30-35	608.19	09/20/2017	9.90	598.29
			12/07/2017	10.86	597.33
			03/21/2018	9.80	598.39
			05/31/2018	8.75	599.44
			08/30/2018	10.12	598.07
			11/26/2018	10.39	597.80
			02/19/2019	8.17	600.02
			05/20/2019	7.47	600.72

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
MW-16	6-16	608.88	02/04/2016	12.13	596.75
			09/14/2016	11.48	597.40
			11/22/2016	12.20	596.68
			02/03/2017	11.78	597.10
			05/04/2017	11.26	597.62
			09/19/2017	11.15	597.73
			12/06/2017	11.59	597.29
			03/21/2018	11.13	597.75
			05/31/2018	10.00	598.88
			08/29/2018	11.44	597.44
			11/26/2018	11.68	597.20
			02/19/2019	9.47	599.41
			05/20/2019	8.58	600.30
MW-17	6-16	607.51	02/05/2016	11.39	596.12
			09/14/2016	10.75	596.76
			11/22/2016	11.44	596.07
			02/03/2017	11.03	596.48
			05/03/2017	10.62	596.89
			09/19/2017	10.35	597.16
			12/06/2017	11.19	596.32
			03/20/2018	10.38	597.13
			05/30/2018	9.08	598.43
			08/28/2018	10.69	596.82
			11/26/2018	10.94	596.57
			02/19/2019	8.76	598.75
			05/20/2019	7.91	599.60
MW-18	10-20	606.47	02/05/2016	13.70	592.77
			09/13/2016	13.24	593.23
			11/22/2016	13.88	592.59
			02/02/2017	13.53	592.94
			05/04/2017	13.01	593.46
			09/20/2017	12.85	593.62
			12/07/2017	13.97	592.50
			03/21/2018	12.98	593.49
			05/31/2018	11.51	594.96
			08/30/2018	18.30	588.17
			11/26/2018	13.40	593.07
			02/19/2019	11.33	595.14
			05/20/2019	10.28	596.19
MW-19	10-20	607.88	02/05/2016	14.45	593.43
			09/14/2016	13.92	593.96
			11/23/2016	14.58	593.30
			02/03/2017	14.20	593.68
			05/04/2017	13.64	594.24
			09/20/2017	13.54	594.34
			12/07/2017	14.67	593.21
			03/21/2018	13.63	594.25
			05/31/2018	12.20	595.68
			08/29/2018	18.94	588.94
			11/26/2018	14.09	593.79
			02/19/2019	12.00	595.88
			05/20/2019	10.97	596.91
MW-20	10-20	605.75	02/04/2016	13.70	592.05
			09/12/2016	12.31	593.44
			11/21/2016	13.95	591.80
			02/01/2017	13.55	592.20
			05/04/2017	12.93	592.82
			09/20/2017	12.95	592.80
			12/07/2017	14.03	591.72
			03/21/2018	12.98	592.77
			05/31/2018	12.01	593.74
			08/30/2018	13.41	592.34
			11/26/2018	13.45	592.30
			02/19/2019	11.36	594.39
			05/20/2019	10.33	595.42
MW-21	10-20	604.80	02/04/2016	13.25	591.55
			09/12/2016	12.99	591.81
			11/21/2016	13.59	591.21
			02/01/2017	13.17	591.63
			05/02/2017	12.55	592.25
			09/19/2017	12.55	592.25
			12/06/2017	13.68	591.12
			03/20/2018	12.53	592.27
			05/30/2018	11.19	593.61
			08/28/2018	13.07	591.73
			11/26/2018	13.08	591.72
			02/19/2019	10.97	593.83
			05/20/2019	9.98	594.82

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
MW-22	10-20	606.94	09/12/2016	13.77	593.17
			11/23/2016	14.41	592.53
			11/23/2016	14.41	592.53
			02/02/2017	14.02	592.92
			05/04/2017	13.46	593.48
			05/04/2017	13.46	593.48
			09/20/2017	13.40	593.54
			12/07/2017	13.64	593.30
			03/21/2018	13.49	593.45
			05/31/2018	12.09	594.85
			08/30/2018	13.83	593.11
			11/26/2018	13.94	593.00
			02/19/2019	11.84	595.10
			05/20/2019	10.84	596.10
MW-23	10-20	607.11	09/13/2016	14.01	593.10
			11/21/2016	14.63	592.48
			02/01/2017	14.22	592.89
			05/02/2017	13.76	593.35
			09/18/2017	13.50	593.61
			12/06/2017	14.72	592.39
			03/20/2018	13.60	593.51
			05/30/2018	12.28	594.83
			08/28/2018	14.07	593.04
			11/26/2018	14.15	592.96
			02/19/2019	12.06	595.05
			05/20/2019	11.07	596.04
MW-24	10-20	607.95	09/14/2016	14.05	593.90
			11/23/2016	14.71	593.24
			02/03/2017	14.32	593.63
			05/02/2017	13.87	594.08
			09/20/2017	14.64	593.31
			12/07/2017	14.82	593.13
			03/21/2018	13.77	594.18
			03/21/2018	13.77	594.18
			05/31/2018	12.35	595.60
			08/30/2018	14.08	593.87
			11/26/2018	14.23	593.72
			02/19/2019	12.12	595.83
			05/20/2019	11.11	596.84
MW-25	10-20	610.37	09/13/2016	15.94	594.43
			11/21/2016	16.60	593.77
			02/01/2017	16.21	594.16
			05/02/2017	15.79	594.58
			09/19/2017	15.55	594.82
			12/06/2017	16.65	593.72
			03/20/2018	15.65	594.72
			05/30/2018	14.20	596.17
			08/28/2018	15.97	594.40
			11/26/2018	15.14	595.23
			02/19/2019	14.02	596.35
			05/20/2019	13.10	597.27
MW-26	7-17	607.37	09/14/2016	10.41	596.96
			11/21/2016	11.56	595.81
			02/03/2017	10.74	596.63
			02/03/2017	10.74	596.63
			05/02/2017	10.29	597.08
			09/20/2017	10.06	597.31
			12/07/2017	10.87	596.50
			03/19/2018	10.36	597.01
			05/31/2018	8.83	598.54
			08/29/2018	10.37	597.00
			11/26/2018	10.66	596.71
			02/19/2019	8.43	598.94
			05/20/2019	NA	NA
MW-27	10-20	607.07	09/19/2017	12.50	594.57
			12/06/2017	13.65	593.42
			03/20/2018	12.71	594.36
			05/30/2018	11.20	595.87
			08/29/2018	12.97	594.10
			11/26/2018	13.13	593.94
			02/19/2019	11.06	596.01
			05/20/2019	10.02	597.05
MW-28	10-20	607.31	09/19/2017	11.10	596.21
			12/06/2017	12.21	595.10
			03/20/2018	11.24	596.07
			05/30/2018	9.87	597.44
			08/29/2018	11.53	595.78
			11/26/2018	11.75	595.56
			02/19/2019	9.62	597.69
			05/20/2019	8.66	598.65

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
MW-29	10-20	608.26	09/19/2017	10.70	597.56
			12/06/2017	11.69	596.57
			03/20/2018	10.72	597.54
			05/30/2018	9.53	598.73
			08/29/2018	11.00	597.26
			11/26/2018	11.25	597.01
			02/19/2019	9.19	599.07
			05/20/2019	8.36	599.90
NPL-MW-04B	89-99	603.54	09/18/2017	12.75	590.79
			12/05/2017	13.80	589.74
			03/19/2018	8.44	595.10
			05/29/2018	8.09	595.45
			08/27/2018	9.64	593.90
			11/26/2018	NA	NA
			02/19/2019	6.95	596.59
			05/20/2019	6.34	597.20
NPL-MW-04M	50-60	603.64	09/18/2017	9.32	594.32
			12/05/2017	10.10	593.54
			03/19/2018	8.63	595.01
			05/29/2018	8.41	595.23
			08/27/2018	9.77	593.87
			11/26/2018	9.42	594.22
			02/19/2019	7.18	596.46
			05/20/2019	6.58	597.06
NPL-MW-04S	8-18	603.42	09/18/2017	9.14	594.28
			12/05/2017	9.90	593.52
			03/19/2018	12.94	590.48
			05/29/2018	11.28	592.14
			08/27/2018	13.25	590.17
			11/26/2018	13.12	590.30
			02/19/2019	10.93	592.49
			05/20/2019	10.03	593.39
NPL-MW-28S	11-21	603.83	09/18/2017	13.59	590.24
			12/05/2017	14.47	589.36
			03/19/2018	13.22	590.61
			05/29/2018	12.05	591.78
			08/27/2018	14.10	589.73
			11/26/2018	13.93	589.90
			02/19/2019	11.73	592.10
			05/20/2019	10.73	593.10

Table 6. Cumulative Monitoring Well Gauging Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	Screen Interval (feet)	TOC Elevation (feet)	Date Sampled	Water Comumn Thickness (ft)	Groundwater Elevation (feet)
NPL-MW-29S	13-23	603.98	09/18/2017	16.40	587.58
			12/05/2017	17.24	586.74
			03/19/2018	15.24	588.74
			05/29/2018	14.86	589.12
			08/27/2018	16.93	587.05
			11/26/2018	16.38	587.60
			02/19/2019	13.71	590.27
			05/20/2019	13.15	590.83
NPL-MW-32S	10.5-20.5	603.75	09/18/2017	13.65	590.10
			12/05/2017	14.63	589.12
			03/19/2018	13.16	590.59
			05/29/2018	12.21	591.54
			08/27/2018	14.11	589.64
			11/26/2018	13.92	589.83
			02/19/2019	11.62	592.13
			05/20/2019	10.89	592.86
NPL-MW-34S	13-23	603.67	09/18/2017	15.87	587.80
			03/19/2018	NA	NA
			05/29/2018	14.47	589.20
			08/27/2018	16.43	587.24
			11/26/2018	NA	NA
			02/19/2019	13.27	590.40
			05/20/2019	12.62	591.05
NPL-MW-35S	11-21	604.08	09/18/2017	12.70	591.38
			12/05/2017	13.64	590.44
			03/19/2018	12.42	591.66
			05/29/2018	11.25	592.83
			08/27/2018	13.18	590.90
			11/26/2018	13.15	590.93
			02/19/2019	11.00	593.08
			05/20/2019	10.06	594.02
NPL-MW-36S	13-23	605.14	09/18/2017	16.50	588.64
			12/05/2017	17.42	587.72
			03/19/2018	16.37	588.77
			05/29/2018	15.05	590.09
			08/27/2018	17.23	587.91
			11/26/2018	16.85	588.29
			02/19/2019	14.40	590.74
			05/20/2019	13.47	591.67

Table 7. Summary of Slug Test Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Well ID	Test	Hydraulic Conductivity		Textural Hydraulic Conductivity	
		Ft/Day	Cm/Sec	Saturated Textures	Hydraulic Conductivity Range[1]
MW-9	R1	39.750	1.40E-02		
	R2	51.420	1.81E-02		
	R3	71.810	2.53E-02		
	Average	54.327	1.92E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	52.749	1.86E-02		
	Standard Deviation	16.226	5.72E-03		
MW-15	R1	88.51	3.12E-02		
	R2	118.1	4.17E-02		
	R3	129	4.55E-02		
	Average	111.870	3.95E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	110.478	3.90E-02		
	Standard Deviation	20.952	7.39E-03		
MW-22	R1	146.8	5.18E-02		
	R2	341.1	1.20E-01		
	R3	328.4	1.16E-01		
	Average	272.100	9.60E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	254.295	8.97E-02		
	Standard Deviation	108.699	3.83E-02		
MW-24	R1	320.3	1.13E-01		
	R2	167.2	5.90E-02		
	R3	161.2	5.69E-02		
	Average	216.233	7.63E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	205.141	7.24E-02		
	Standard Deviation	90.174	3.18E-02		
MW-26	R1	92.06	3.25E-02		
	R2	107.9	3.81E-02		
	R3	166.7	5.88E-02		
	Average	122.220	4.31E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	118.307	4.17E-02		
	Standard Deviation	39.327	1.39E-02		

Site	Average	155.350	5.15E-02
	Geometric Mean	148.19	4.910E-02
	Standard Deviation	55.08	1.715E-02

[1] Textural hydraulic conductivity range based on log descriptions and representative values illustrated in Freeze and Cherry (1979), page 29.

Table 8. Cumulative Soil Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Location	Date Sampled	Sample Depth	Sample Type	Tetrachloroethene (mg/kg)	Trichloroethene (mg/kg)	cis-1,2-Dichloroethene (mg/kg)	trans-1,2-Dichloroethene (mg/kg)	Vinyl chloride (mg/kg)	Naphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	1,2,4-Trimethylbenzene (mg/kg)	1,3,5-Trimethylbenzene (mg/kg)	n-Butylbenzene (mg/kg)	n-Propylbenzene (mg/kg)	sec-Butylbenzene (mg/kg)
Residential Migration to Groundwater Screening Level				**0.045**	**0.036**	**0.41**	**0.62**	**0.014**	**0.11**	**3.7**	**1.6**	**1.7**	**64**	**25**	**120**
Residential Direct Contact Screening Level				110	5.7	220	1,900	0.83	53	340	220	180	110	260	150
Commercial Industrial Direct Contact Screening Level				*170*	*19*	*2,300*	*1,900*	*17*	*170*	*3,000*	*220*	*180*	*110*	*260*	*150*
Excavation Direct Contact Screening Level				170	95	2,400	1,900	1300	3100	6,800	220	180	110	260	150
HA-01	9/29/2014	3-3.5 ft	N	**7.17**	< 0.0043	< 0.0043	< 0.0043	< 0.0043	NA	NA	NA	NA	NA	NA	NA
HA-01	9/29/2014	3.5-4 ft	N	**0.217**	< 0.0045	< 0.0045	< 0.0045	< 0.0045	NA	NA	NA	NA	NA	NA	NA
MW-01	1/20/2015	4-5 ft	N	0.0061	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0086	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
MW-02	1/20/2015	3-5 ft	N	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0086	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
MW-03	1/20/2015	3-5 ft	N	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0080	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
B-04	1/20/2015	3-4 ft	N	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0083	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
B-04	1/20/2015	3-4 ft	FD	0.0323	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0078	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039
B-05	1/20/2015	3-5 ft	N	0.0273	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
B-06	3/18/2015	2-4 ft	N	0.0095	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
B-06	3/18/2015	5-6 ft	N	0.0088	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
B-07	3/18/2015	3-4 ft	N	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0083	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
B-07	3/18/2015	6-7 ft	N	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0078	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039
B-08	3/18/2015	1-2 ft	N	0.0105	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0086	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
B-08	3/18/2015	1-2 ft	FD	**0.238**	0.0064	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0081	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
B-08	3/18/2015	3-5 ft	N	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0081	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
MW-04	3/18/2015	3-4 ft	N	**0.0688**	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
MW-06	3/18/2015	5-6.5 ft	N	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040	0.0082	< 0.0040	< 0.0040	< 0.0040	< 0.0040	< 0.0040
MW-07	9/24/2015	4-5 ft	N	< 0.0035	< 0.0035	< 0.0035	< 0.0035	< 0.0035	< 0.0035	< 0.0071	< 0.0035	< 0.0035	< 0.0035	< 0.0035	< 0.0035
MW-08	9/24/2015	4-5 ft	N	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0091	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0046
MW-09	9/24/2015	4-5 ft	N	0.0186	< 0.0048	< 0.0048	< 0.0048	< 0.0048	< 0.0048	< 0.0096	< 0.0048	< 0.0048	< 0.0048	< 0.0048	< 0.0048
MW-10	9/24/2015	3-4 ft	N	**0.0683**	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0065	< 0.0033	< 0.0033	< 0.0033	< 0.0033	< 0.0033
MW-10	9/24/2015	6-7 ft	N	0.0071	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0084	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
B-09	9/25/2015	5-6 ft	N	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0078	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039
B-10	9/25/2015	5-6 ft	N	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0078	< 0.0039	< 0.0039	< 0.0039	< 0.0039	< 0.0039
B-11	9/25/2015	5-6 ft	N	0.0106	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
SB-045	8/23/2017	4-6 ft	N	0.0143	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.01	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
SB-046	8/23/2017	6-8 ft	N	0.0174	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
SB-066	8/22/2017	4-6 ft	N	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0092	< 0.0046	< 0.0046	< 0.0046	< 0.0046	< 0.0046
B-68	6/6/2019	4-5 ft	N	0.0366	< 0.0047	< 0.0047	< 0.0047	< 0.0047	< 0.0047	< 0.0093	< 0.0047	< 0.0047	< 0.0047	< 0.0047	< 0.0047
B-69	6/6/2019	9-9.5 ft	N	0.0130	< 0.0048	< 0.0048	< 0.0048	< 0.0048	< 0.0048	< 0.0096	< 0.0048	< 0.0048	< 0.0048	< 0.0048	< 0.0048
B-70	6/6/2019	9-9.5 ft	N	< 0.0064	< 0.0064	< 0.0064	< 0.0064	< 0.0064	< 0.0064	< 0.0129	< 0.0064	< 0.0064	< 0.0064	< 0.0064	< 0.0064
B-71	6/6/2019	9-9.5 ft	N	0.0440	0.0077	< 0.0051	< 0.0051	< 0.0051	< 0.0051	< 0.0103	< 0.0051	< 0.0051	< 0.0051	< 0.0051	< 0.0051
B-71	6/6/2019	9-9.5 ft	FD	0.0094	< 0.0055	< 0.0055	< 0.0055	< 0.0055	< 0.0055	< 0.0111	< 0.0055	< 0.0055	< 0.0055	< 0.0055	< 0.0055
B-72	6/6/2019	9-9.5 ft	N	**0.0531**	< 0.0052	< 0.0052	< 0.0052	< 0.0052	< 0.0052	< 0.0105	< 0.0052	< 0.0052	< 0.0052	< 0.0052	< 0.0052
B-73	6/6/2019	9-9.5 ft	N	**0.0863**	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0098	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0049
B-74	6/6/2019	9-9.5 ft	N	**0.156**	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0097	< 0.0049	< 0.0049	< 0.0049	< 0.0049	< 0.0049
B-75	6/6/2019	9-9.5 ft	N	**0.0704**	< 0.0047	< 0.0047	< 0.0047	< 0.0047	< 0.0047	< 0.0095	< 0.0047	< 0.0047	< 0.0047	< 0.0047	< 0.0047

Notes:
NA = Not Analyzed
N = Normal Field Sample
FD = Field Duplicate Sample
mg/kg = milligrams per kilogram
< = Analyte not detected at the specific detection level
Screening levels obtained from IDEM's Remediation Closure Guide (RCG), March 22, 2012, updated March 2019
Bold values exceed IDEM RCG Residential Migration to Groundwater Screening Levels for Soil
Underlined values exceed IDEM RCG Residential Direct Contact Screening Levels for Soil
Italic values exceed IDEM RCG Commercial/Industrial Direct Contact Screening Levels for Soil
Shaded cells exceed IDEM RCG Excavation Direct Contact Screening Levels for Soil

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-01	98.57	6-16	01/23/2015	N	NM	10.90	87.67	**53.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-01	98.57	6-16	01/23/2015	FD	NM	10.90	87.67	**61**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-01	98.57	6-16	04/21/2015	N	NM	9.93	88.64	**40.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	98.57	6-16	09/28/2015	N	NM	9.88	88.69	**60.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	02/04/2016	WLO	NM	11.02	600.72	Gauged Only									
MW-01	611.74	6-16	09/14/2016	N	NM	10.34	601.40	**65.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	09/14/2016	FD	NM	10.34	601.40	**61.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	11/22/2016	N	NM	11.12	600.62	**26.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	02/03/2017	N	NM	10.71	601.03	**8.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	05/03/2017	N	NM	10.05	601.69	**11.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	09/19/2017	N	NM	10.10	601.64	**31.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	12/06/2017	N	NM	10.87	600.87	**12.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	03/21/2018	N	NM	NA	NA	**32.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	05/30/2018	N	NM	8.94	602.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	08/29/2018	N	NM	10.22	601.52	**37.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	11/27/2018	N	NM	10.55	601.19	**67.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	02/21/2019	N	NM	8.27	603.47	**36.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	05/21/2019	N	NM	7.67	604.07	**32.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	99.99	6-16	01/23/2015	N	NM	12.10	87.89	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-02	99.99	6-16	04/06/2015	WLO	NM	11.48	88.51	Gauged Only									
MW-02	99.99	6-16	09/28/2015	N	NM	11.02	88.97	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	02/04/2016	WLO	NM	12.25	600.90	Gauged Only									
MW-02	613.15	6-16	09/12/2016	N	NM	11.55	601.60	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	11/21/2016	N	NM	12.41	600.74	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	02/01/2017	N	NM	11.89	601.26	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	05/02/2017	N	NM	11.35	601.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	09/18/2017	N	NM	11.26	601.89	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	12/05/2017	N	NM	12.20	600.95	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	03/19/2018	N	NM	11.10	602.05	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	05/29/2018	N	NM	9.98	603.17	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	08/27/2018	N	NM	11.42	601.73	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	11/26/2018	N	NM	11.75	601.40	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	02/20/2019	N	NM	9.40	603.75	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	05/20/2019	N	NM	8.70	604.45	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	99.14	6-16	01/23/2015	N	NM	11.10	88.04	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-03	99.14	6-16	04/06/2015	WLO	NM	10.47	88.67	Gauged Only									
MW-03	99.14	6-16	09/28/2015	N	NM	10.05	89.09	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-03	612.33	6-16	02/04/2016	WLO	NM	11.25	601.08	Gauged Only									
MW-03	612.33	6-16	09/13/2016	N	NM	10.54	601.79	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	11/21/2016	N	NM	11.32	601.01	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	02/02/2017	N	NM	10.91	601.42	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	05/03/2017	N	NM	10.27	602.06	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	09/18/2017	N	NM	10.27	602.06	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	12/05/2017	N	NM	11.20	601.13	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	03/19/2018	N	NM	10.15	602.18	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	05/29/2018	N	NM	9.06	603.27	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	08/28/2018	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	11/26/2018	N	NM	10.74	601.59	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	02/20/2019	N	NM	8.43	603.90	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	05/20/2019	N	NM	7.79	604.54	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	98.32	6-16	04/06/2015	N	NM	10.15	88.17	**30.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	98.32	6-16	09/28/2015	N	NM	9.78	88.54	**26.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	02/04/2016	WLO	NM	10.93	600.54	Gauged Only									
MW-04	611.47	6-16	09/14/2016	N	NM	10.26	601.21	**32.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	11/22/2016	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	02/03/2017	N	NM	10.60	600.87	**5.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	05/03/2017	N	NM	9.91	601.56	**7.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	09/19/2017	N	NM	10.00	601.47	**12.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	12/06/2017	N	NM	11.03	600.44	**6.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	03/20/2018	N	NM	9.87	601.60	**8.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	05/30/2018	N	NM	8.85	602.62	**25.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	08/29/2018	N	NM	10.11	601.36	**5.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	11/27/2018	N	NM	10.44	601.03	**8.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	02/21/2019	N	NM	8.16	603.31	**34.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	05/21/2019	N	NM	7.62	603.85	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	98.60	6-16	04/06/2015	N	NM	10.12	88.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	98.60	6-16	04/06/2015	FD	NM	10.12	88.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	98.60	6-16	09/28/2015	N	NM	9.77	88.83	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	02/04/2016	WLO	NM	10.90	600.87	Gauged Only									
MW-05	611.77	6-16	09/12/2016	N	NM	10.19	601.58	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	11/21/2016	N	NM	10.97	600.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	02/02/2017	N	NM	10.55	601.22	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	05/03/2017	N	NM	9.87	601.90	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	09/18/2017	N	NM	9.98	601.79	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-05	611.77	6-16	12/05/2017	N	NM	10.83	600.94	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	03/19/2018	N	NM	9.85	601.92	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	05/30/2018	N	NM	8.84	602.93	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	08/28/2018	N	NM	10.08	601.69	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	11/26/2018	N	NM	10.41	601.36	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	02/20/2019	N	NM	8.18	603.59	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	05/21/2019	N	NM	7.64	604.13	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	97.56	6-16	04/06/2015	N	NM	10.10	87.46	**119**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	97.56	6-16	09/28/2015	N	NM	9.66	87.90	**142**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	97.56	6-16	09/28/2015	FD	NM	9.66	87.90	**150**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	02/04/2016	WLO	NM	10.82	600.04	Gauged Only									
MW-06	610.86	6-16	09/14/2016	N	NM	10.13	600.73	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	11/23/2016	N	NM	10.94	599.92	**81.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	02/03/2017	N	NM	10.50	600.36	**85.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	05/04/2017	N	NM	9.66	601.20	**78.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	09/20/2017	N	NM	9.89	600.97	**108**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	12/07/2017	N	NM	10.77	600.09	**87.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	03/21/2018	N	NM	9.70	601.16	**69.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	05/31/2018	N	NM	8.75	602.11	**83.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	08/30/2018	N	NM	10.02	600.84	**100**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	11/28/2018	N	NM	10.34	600.52	**80.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	02/21/2019	N	NM	8.11	602.75	**46.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	05/22/2019	N	NM	6.44	604.42	**38.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	97.03	6-16	09/28/2015	N	NM	9.51	87.52	**8.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	02/04/2016	WLO	NM	10.64	599.71	Gauged Only									
MW-07	610.35	6-16	09/13/2016	N	NM	9.94	600.41	**12.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	11/22/2016	N	NM	10.69	599.66	**7.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	02/02/2017	N	NM	10.20	600.15	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	05/03/2017	N	NM	9.64	600.71	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	09/18/2017	N	NM	9.70	600.65	**7.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	12/05/2017	N	NM	10.60	599.75	**6.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	03/19/2018	N	NM	9.55	600.80	**5.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	05/30/2018	N	NM	8.60	601.75	**8.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	08/28/2018	N	NM	9.84	600.51	**14.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	11/26/2018	N	NM	10.16	600.19	**6.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	02/20/2019	N	NM	7.93	602.42	**6.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	05/21/2019	N	NM	7.36	602.99	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-08	97.52	6-16	09/28/2015	N	NM	9.95	87.57	**65.7**	< 5.0	18.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	02/04/2016	WLO	NM	11.16	599.70	Gauged Only									
MW-08	610.86	6-16	09/14/2016	N	NM	10.41	600.45	**88.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	09/14/2016	FD	NM	10.41	600.45	**75.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	11/23/2016	N	NM	11.17	599.69	**61.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	02/03/2017	N	NM	10.72	600.14	**18.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	05/03/2017	N	NM	10.15	600.71	**31.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	09/19/2017	N	NM	10.15	600.71	**66.5**	< 5.0	5.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	12/07/2017	N	NM	10.71	600.15	**116**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	03/21/2018	N	NM	9.99	600.87	**81.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	05/31/2018	N	NM	9.04	601.82	**52.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	07/31/2018	N	NM	NA	NA	**67.8**	< 5.0	9.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	08/28/2018	N	NM	10.30	600.56	**84.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	11/27/2018	N	NM	10.62	600.24	**78.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	02/21/2019	N	NM	8.37	602.49	**51.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	05/22/2019	N	NM	7.75	603.11	**13.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	97.48	6-16	09/28/2015	N	NM	10.77	86.71	**276**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/04/2016	WLO	NM	11.96	598.85	Gauged Only									
MW-09	610.81	6-16	09/14/2016	N	NM	11.26	599.55	**376**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	11/23/2016	N	NM	12.00	598.81	**310**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	11/23/2016	FD	NM	12.00	598.81	**350**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/03/2017	N	NM	11.61	599.20	**145**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/03/2017	FD	NM	11.61	599.20	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	05/04/2017	N	NM	11.05	599.76	**80.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	09/20/2017	N	NM	10.96	599.85	**293**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	12/07/2017	N	NM	11.56	599.25	**329**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	03/21/2018	N	NM	10.88	599.93	**290**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	05/31/2018	N	NM	9.82	600.99	**245**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	07/30/2018	N	NM	NA	NA	**291**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	08/29/2018	N	NM	11.15	599.66	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	11/28/2018	N	NM	11.43	599.38	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/22/2019	N	NM	9.21	601.60	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	05/23/2019	N	NM	8.53	602.28	**7.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	09/20/2017	N	NM	11.10	599.79	**58.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	12/07/2017	N	NM	11.85	599.04	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	03/21/2018	N	NM	11.02	599.87	**31.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
							Residential Groundwater Tap Screening Levels	**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
							Residential Vapor Intrusion Groundwater Screening Levels	110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
							Commercial/Industrial Vapor Intrusion Groundwater Screening Levels	*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-09D	610.89	32.5-37.5	05/31/2018	N	NM	9.99	600.90	**78.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	07/30/2018	N	NM	NA	NA	**82.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	08/29/2018	N	NM	11.30	599.59	**10.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	11/28/2018	N	NM	11.58	599.31	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	02/22/2019	N	NM	9.35	601.54	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	05/23/2019	N	NM	8.70	602.19	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	97.88	6-16	09/28/2015	N	NM	10.95	86.93	**33**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	02/04/2016	WLO	NM	12.19	599.01	Gauged Only									
MW-10	611.20	6-16	09/14/2016	N	NM	11.49	599.71	**28.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	11/22/2016	N	NM	12.21	598.99	**20.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	02/02/2017	N	NM	11.83	599.37	**17.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	05/03/2017	N	NM	11.34	599.86	**11.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	09/19/2017	N	NM	11.16	600.04	**17.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	12/07/2017	N	NM	11.92	599.28	**21.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	03/21/2018	N	NM	11.03	600.17	**14.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	05/31/2018	N	NM	9.99	601.21	**17.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	07/30/2018	N	NM	NA	NA	**15.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	08/28/2018	N	NM	11.39	599.81	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	11/27/2018	N	NM	11.68	599.52	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	02/21/2019	N	NM	9.45	601.75	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	05/22/2019	N	NM	8.77	602.43	**6.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	02/04/2016	N	NM	12.71	598.09	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	09/13/2016	N	NM	11.95	598.85	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	11/21/2016	N	NM	12.70	598.10	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	02/02/2017	N	NM	12.35	598.45	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	05/03/2017	N	NM	11.88	598.92	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	09/18/2017	N	NM	11.64	599.16	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	12/05/2017	N	NM	12.65	598.15	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	03/19/2018	N	NM	11.49	599.31	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	05/30/2018	N	NM	10.40	600.40	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	07/31/2018	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	07/31/2018	FD	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	08/28/2018	N	NM	11.90	598.90	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	11/26/2018	N	NM	12.20	598.60	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	02/20/2019	N	NM	9.95	600.85	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	05/21/2019	N	NM	9.16	601.64	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-12	609.76	6-16	02/04/2016	N	NM	10.26	599.50	**10.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	09/14/2016	N	NM	9.63	600.13	**9.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	11/22/2016	N	NM	11.37	598.39	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	02/02/2017	N	NM	9.91	599.85	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	05/03/2017	N	NM	9.17	600.59	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	09/18/2017	N	NM	9.40	600.36	**7.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	12/05/2017	N	NM	10.28	599.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	03/19/2018	N	NM	9.26	600.50	**5.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	05/30/2018	N	NM	8.32	601.44	**9.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	08/28/2018	N	NM	9.52	600.24	**15.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	11/27/2018	N	NM	9.82	599.94	**10.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	02/20/2019	N	NM	7.64	602.12	**11.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	05/21/2019	N	NM	7.16	602.60	**9.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	02/04/2016	N	NM	10.90	598.42	**13.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	09/13/2016	N	NM	10.19	599.13	**19.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	11/22/2016	N	NM	10.94	598.38	**21.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	02/02/2017	N	NM	10.50	598.82	**14.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	05/03/2017	N	NM	9.85	599.47	**16.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	09/19/2017	N	NM	9.95	599.37	**13.1**	< 5.0	10.4	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	12/07/2017	N	NM	10.90	598.42	**16.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	03/20/2018	N	NM	9.85	599.47	**19.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	05/30/2018	N	NM	8.85	600.47	**18.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	08/29/2018	N	NM	10.11	599.21	**21.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	11/28/2018	N	NM	10.41	598.91	**23.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	02/21/2019	N	NM	8.22	601.10	**19.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	05/22/2019	N	NM	7.66	601.66	**10.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	02/05/2016	N	NM	10.62	597.43	**9.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	09/13/2016	N	NM	9.90	598.15	**14.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	11/22/2016	N	NM	10.66	597.39	**13.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	02/02/2017	N	NM	10.26	597.79	**10.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	05/03/2017	N	NM	9.67	598.38	**10.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	09/19/2017	N	NM	9.66	598.39	**12.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	12/06/2017	N	NM	10.55	597.50	**11.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	03/20/2018	N	NM	9.59	598.46	**9.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	05/30/2018	N	NM	8.50	599.55	**10.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	08/29/2018	N	NM	9.88	598.17	**14.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	11/27/2018	N	NM	10.16	597.89	**15.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-14	608.05	6-16	02/21/2019	N	NM	7.97	600.08	**6.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	05/21/2019	N	NM	7.35	600.70	**5.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/05/2016	N	NM	10.72	597.38	**178**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/05/2016	FD	NM	10.72	597.38	**202**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	09/14/2016	N	NM	10.06	598.04	**207**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	11/23/2016	N	NM	10.78	597.32	**224**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/03/2017	N	NM	10.40	597.70	**233**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/04/2017	N	NM	9.70	598.40	**195**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/04/2017	FD	NM	9.70	598.40	**212**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	09/20/2017	N	NM	9.72	598.38	**156**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	09/20/2017	FD	NM	9.72	598.38	**142**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	12/07/2017	N	NM	10.71	597.39	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	12/07/2017	FD	NM	10.71	597.39	**119**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	03/21/2018	N	NM	10.66	597.44	**121**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	03/21/2018	FD	NM	10.66	597.44	**97.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/31/2018	N	NM	9.00	599.10	**154**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/31/2018	FD	NM	9.00	599.10	**144**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	07/30/2018	N	NM	NA	NA	**165**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	08/30/2018	N	NM	9.99	598.11	**128**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	08/30/2018	FD	NM	9.99	598.11	**132**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	11/28/2018	N	NM	10.27	597.83	**147**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	11/28/2018	FD	NM	10.27	597.83	**167**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/22/2019	N	NM	8.05	600.05	**86.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/22/2019	FD	NM	8.05	600.05	**95.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/23/2019	N	NM	7.40	600.70	**156**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/23/2019	FD	NM	7.40	600.70	**185**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	02/04/2016	N	NM	12.13	596.75	**19.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	09/14/2016	N	NM	11.48	597.40	**16.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	11/22/2016	N	NM	12.20	596.68	**21.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	02/03/2017	N	NM	11.78	597.10	**18.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	05/04/2017	N	NM	11.26	597.62	**15.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	09/19/2017	N	NM	11.15	597.73	**11.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	12/06/2017	N	NM	11.59	597.29	**24.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	03/21/2018	N	NM	11.13	597.75	**12.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	05/31/2018	N	NM	10.00	598.88	**9.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	07/31/2018	N	NM	NA	NA	**18.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	08/29/2018	N	NM	11.44	597.44	**20.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[(1)] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
							Residential Groundwater Tap Screening Levels	**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
							Residential Vapor Intrusion Groundwater Screening Levels	110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
							Commercial/Industrial Vapor Intrusion Groundwater Screening Levels	*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-16	608.88	6-16	11/27/2018	N	NM	11.68	597.20	**30.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	02/21/2019	N	NM	9.47	599.41	**14.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	05/23/2019	N	NM	8.58	600.30	**7.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	09/20/2017	N	NM	9.90	598.29	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	12/07/2017	N	NM	10.86	597.33	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	03/21/2018	N	NM	9.80	598.39	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	05/31/2018	N	NM	8.75	599.44	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	07/30/2018	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	08/30/2018	N	NM	10.12	598.07	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	11/28/2018	N	NM	10.39	597.80	**9.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	02/22/2019	N	NM	8.17	600.02	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	05/23/2019	N	NM	7.47	600.72	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	02/05/2016	N	NM	11.39	596.12	**21.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	09/14/2016	N	NM	10.75	596.76	**33.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	11/22/2016	N	NM	11.44	596.07	**17.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	02/03/2017	N	NM	11.03	596.48	**13.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	05/03/2017	N	NM	10.62	596.89	**13.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	09/19/2017	N	NM	10.35	597.16	**24.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	12/06/2017	N	NM	11.19	596.32	**20.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	03/20/2018	N	NM	10.38	597.13	**16.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	05/30/2018	N	NM	9.08	598.43	**25.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	07/30/2018	N	NM	NA	NA	**16.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	08/28/2018	N	NM	10.69	596.82	**26.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	11/28/2018	N	NM	10.94	596.57	**22.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	02/21/2019	N	NM	NA	NA	**17.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	05/22/2019	N	NM	7.91	599.60	**12.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	02/05/2016	N	NM	13.70	592.77	**19.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	09/13/2016	N	NM	13.24	593.23	**25.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	11/22/2016	N	NM	13.88	592.59	**26.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	02/02/2017	N	NM	13.53	592.94	**32.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	05/04/2017	N	NM	13.01	593.46	**39.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	09/20/2017	N	NM	12.85	593.62	**16.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	12/07/2017	N	NM	13.97	592.50	**26.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	03/21/2018	N	NM	12.98	593.49	**12.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	05/31/2018	N	NM	11.51	594.96	**18.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	08/30/2018	N	NM	18.30	588.17	**20.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water(1) (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
							Residential Groundwater Tap Screening Levels	**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
							Residential Vapor Intrusion Groundwater Screening Levels	110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
							Commercial/Industrial Vapor Intrusion Groundwater Screening Levels	*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-18	606.47	10-20	11/27/2018	N	NM	13.40	593.07	**23.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	02/21/2019	N	NM	11.33	595.14	**8.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	05/22/2019	N	NM	10.28	596.19	**6.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	02/05/2016	N	NM	14.45	593.43	**93.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	09/14/2016	N	NM	13.92	593.96	**104**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	11/23/2016	N	NM	14.58	593.30	**119**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	02/03/2017	N	NM	14.20	593.68	**96.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	05/04/2017	N	NM	13.64	594.24	**84.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	09/20/2017	N	NM	13.54	594.34	**63.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	12/07/2017	N	NM	14.67	593.21	**103**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	03/21/2018	N	NM	13.63	594.25	**46.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	05/31/2018	N	NM	12.20	595.68	**60.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	07/30/2018	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	08/29/2018	N	NM	18.94	588.94	**67.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	11/28/2018	N	NM	14.09	593.79	**69.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	02/22/2019	N	NM	12.00	595.88	**51.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	05/23/2019	N	NM	10.97	596.91	**21.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	02/04/2016	N	NM	13.70	592.05	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	09/12/2016	N	NM	12.31	593.44	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	11/21/2016	N	NM	13.95	591.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	02/01/2017	N	NM	13.55	592.20	**61.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	05/04/2017	N	NM	12.93	592.82	**13.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	09/20/2017	N	NM	12.95	592.80	**9.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	12/07/2017	N	NM	14.03	591.72	**47.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	03/21/2018	N	NM	12.98	592.77	**22.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	05/31/2018	N	NM	12.01	593.74	**7.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	08/30/2018	N	NM	13.41	592.34	**12.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	11/28/2018	N	NM	13.45	592.30	**18.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	02/21/2019	N	NM	11.36	594.39	**10.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	05/22/2019	N	NM	10.33	595.42	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	02/04/2016	N	NM	13.25	591.55	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	09/12/2016	N	NM	12.99	591.81	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	11/21/2016	N	NM	13.59	591.21	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	02/01/2017	N	NM	13.17	591.63	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	05/02/2017	N	NM	12.55	592.25	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	09/19/2017	N	NM	12.55	592.25	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[(1)] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
<u>Residential Vapor Intrusion Groundwater Screening Levels</u>								<u>110</u>	<u>9.1</u>	<u>NE</u>	<u>NE</u>	<u>2.1</u>	<u>110</u>	<u>NE</u>	<u>NE</u>	<u>NE</u>	<u>NE</u>
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-21	604.80	10-20	12/06/2017	N	NM	13.68	591.12	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	03/20/2018	N	NM	12.53	592.27	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	05/30/2018	N	NM	11.19	593.61	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	08/28/2018	N	NM	13.07	591.73	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	11/27/2018	N	NM	13.08	591.72	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	02/20/2019	N	NM	10.97	593.83	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	05/22/2019	N	NM	9.98	594.82	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	09/12/2016	N	NM	13.77	593.17	<u>**147**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	11/23/2016	N	NM	14.41	592.53	<u>**133**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	11/23/2016	FD	NM	14.41	592.53	**107**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	02/02/2017	N	NM	14.02	592.92	<u>**184**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/04/2017	N	NM	13.46	593.48	<u>**131**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/04/2017	FD	NM	13.46	593.48	<u>**132**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	09/20/2017	N	NM	13.40	593.54	**103**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	12/07/2017	N	NM	13.64	593.30	**92.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	03/21/2018	N	NM	13.49	593.45	**88.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/31/2018	N	NM	12.09	594.85	**57.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	08/30/2018	N	NM	13.83	593.11	**97.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	11/28/2018	N	NM	13.94	593.00	<u>**121**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	02/22/2019	N	NM	11.84	595.10	**77.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/23/2019	N	NM	10.84	596.10	**24.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	09/13/2016	N	NM	14.01	593.10	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	11/21/2016	N	NM	14.63	592.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	02/01/2017	N	NM	14.22	592.89	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	05/02/2017	N	NM	13.76	593.35	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	09/18/2017	N	NM	13.50	593.61	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	12/06/2017	N	NM	14.72	592.39	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	03/20/2018	N	NM	13.60	593.51	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	05/30/2018	N	NM	12.28	594.83	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	08/28/2018	N	NM	14.07	593.04	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	11/27/2018	N	NM	14.15	592.96	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	02/20/2019	N	NM	12.06	595.05	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	05/22/2019	N	NM	11.07	596.04	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	09/14/2016	N	NM	14.05	593.90	<u>**189**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	11/23/2016	N	NM	14.71	593.24	<u>**154**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	02/03/2017	N	NM	14.32	593.63	<u>**208**</u>	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-24	607.95	10-20	05/02/2017	NA	NM	13.87	594.08	Not Sampled									
MW-24	607.95	10-20	09/20/2017	N	NM	14.64	593.31	**98.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	09/20/2017	FD	NM	14.64	593.31	**89.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	12/07/2017	N	NM	14.82	593.13	**128**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	12/07/2017	FD	NM	14.82	593.13	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	03/21/2018	N	NM	13.77	594.18	**145**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	03/21/2018	FD	NM	13.77	594.18	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/31/2018	N	NM	12.35	595.60	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/31/2018	FD	NM	12.35	595.60	**122**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	07/30/2018	N	NM	NA	NA	**79.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	08/30/2018	N	NM	14.08	593.87	**108**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	08/30/2018	FD	NM	14.08	593.87	**208**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	11/28/2018	N	NM	14.23	593.72	**157**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	11/28/2018	FD	NM	14.23	593.72	**136**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	02/22/2019	N	NM	NA	NA	**111**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	02/22/2019	FD	NM	NA	NA	**108**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/23/2019	N	NM	11.11	596.84	**57.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/23/2019	FD	NM	11.11	596.84	**62.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	09/13/2016	N	NM	15.94	594.43	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	11/21/2016	N	NM	16.60	593.77	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	02/01/2017	N	NM	16.21	594.16	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	05/02/2017	N	NM	15.79	594.58	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	09/19/2017	N	NM	15.55	594.82	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	12/06/2017	N	NM	16.65	593.72	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	03/20/2018	N	NM	15.65	594.72	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	05/30/2018	N	NM	14.20	596.17	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	08/28/2018	N	NM	15.97	594.40	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	11/27/2018	N	NM	15.14	595.23	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	02/20/2019	N	NM	14.02	596.35	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	05/22/2019	N	NM	13.10	597.27	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	09/14/2016	N	NM	10.41	596.96	**223**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	11/21/2016	WLO	NM	11.56	595.81	Gauged Only									
MW-26	607.37	7-17	02/03/2017	N	NM	10.74	596.63	**146**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	02/03/2017	FD	NM	10.74	596.63	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	05/02/2017	NA	NM	10.29	597.08	Not Sampled									
MW-26	607.37	7-17	09/20/2017	N	NM	10.06	597.31	**99.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	12/07/2017	N	NM	10.87	596.50	**180**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-26	607.37	7-17	03/19/2018	WLO	NM	10.36	597.01	Gauged Only									
MW-26	607.37	7-17	05/31/2018	N	NM	8.83	598.54	**75.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	07/31/2018	N	NM	NA	NA	**124**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	08/29/2018	N	NM	10.37	597.00	**154**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	11/28/2018	N	NM	10.66	596.71	**163**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	02/22/2019	N	NM	8.43	598.94	**61.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	05/20/2019	NA	NM	NA	NA	Not Sampled									
MW-27	607.07	10-20	09/19/2017	N	NM	12.50	594.57	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	12/06/2017	N	NM	13.65	593.42	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	03/20/2018	N	NM	12.71	594.36	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	05/30/2018	N	NM	11.20	595.87	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	08/29/2018	N	NM	12.97	594.10	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	11/27/2018	N	NM	13.13	593.94	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	02/20/2019	N	NM	11.06	596.01	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	05/22/2019	N	NM	10.02	597.05	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	09/19/2017	N	NM	11.10	596.21	**11.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	12/06/2017	N	NM	12.21	595.10	**11.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	03/20/2018	N	NM	11.24	596.07	**10.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	05/30/2018	N	NM	9.87	597.44	**11.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	08/29/2018	N	NM	11.53	595.78	**17.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	11/27/2018	N	NM	11.75	595.56	**16.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	02/21/2019	N	NM	9.62	597.69	**10.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	05/20/2019	N	NM	8.66	598.65	**11.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	09/19/2017	N	NM	10.70	597.56	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	12/06/2017	N	NM	11.69	596.57	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	03/20/2018	N	NM	10.72	597.54	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	05/30/2018	N	NM	9.53	598.73	**55.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	08/29/2018	N	NM	11.00	597.26	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	11/27/2018	N	NM	11.25	597.01	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	02/21/2019	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	05/21/2019	N	NM	8.36	599.90	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
NPL-MW-04B	603.54	89-99	09/18/2017	WLO	NM	12.75	590.79	Gauged Only									
NPL-MW-04B	603.54	89-99	12/05/2017	WLO	NM	13.80	589.74	Gauged Only									
NPL-MW-04B	603.54	89-99	03/19/2018	WLO	NM	8.44	595.10	Gauged Only									
NPL-MW-04B	603.54	89-99	05/29/2018	WLO	NM	8.09	595.45	Gauged Only									

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[(1)] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
NPL-MW-04B	603.54	89-99	08/27/2018	WLO	NM	9.64	593.90	Gauged Only									
NPL-MW-04B	603.54	89-99	11/26/2018	WLO	NM	NA	NA	Not Sampled									
NPL-MW-04B	603.54	89-99	05/20/2019	WLO	NM	6.34	597.20	Gauged Only									
NPL-MW-04M	603.64	50-60	09/18/2017	WLO	NM	9.32	594.32	Gauged Only									
NPL-MW-04S	603.42	8-18	09/18/2017	WLO	NM	9.14	594.28	Gauged Only									
NPL-MW-04M	603.64	50-60	12/05/2017	WLO	NM	10.10	593.54	Gauged Only									
NPL-MW-04S	603.42	8-18	12/05/2017	WLO	NM	9.90	593.52	Gauged Only									
NPL-MW-04M	603.64	50-60	03/19/2018	WLO	NM	8.63	595.01	Gauged Only									
NPL-MW-04S	603.42	8-18	03/19/2018	WLO	NM	12.94	590.48	Gauged Only									
NPL-MW-04M	603.64	50-60	05/29/2018	WLO	NM	8.41	595.23	Gauged Only									
NPL-MW-04S	603.42	8-18	05/29/2018	WLO	NM	11.28	592.14	Gauged Only									
NPL-MW-04M	603.64	50-60	08/27/2018	WLO	NM	9.77	593.87	Gauged Only									
NPL-MW-04S	603.42	8-18	08/27/2018	WLO	NM	13.25	590.17	Gauged Only									
NPL-MW-04M	603.64	50-60	11/26/2018	WLO	NM	9.42	594.22	Gauged Only									
NPL-MW-04S	603.42	8-18	11/26/2018	WLO	NM	13.12	590.30	Gauged Only									
NPL-MW-04M	603.64	50-60	05/20/2019	WLO	NM	6.58	597.06	Gauged Only									
NPL-MW-04S	603.42	8-18	05/20/2019	WLO	NM	10.03	593.39	Gauged Only									
NPL-MW-28S	603.83	11-21	09/18/2017	WLO	NM	13.59	590.24	Gauged Only									
NPL-MW-28S	603.83	11-21	12/05/2017	WLO	NM	14.47	589.36	Gauged Only									
NPL-MW-28S	603.83	11-21	03/19/2018	WLO	NM	13.22	590.61	Gauged Only									
NPL-MW-28S	603.83	11-21	05/29/2018	WLO	NM	12.05	591.78	Gauged Only									
NPL-MW-28S	603.83	11-21	08/27/2018	WLO	NM	14.10	589.73	Gauged Only									
NPL-MW-28S	603.83	11-21	11/26/2018	WLO	NM	13.93	589.90	Gauged Only									
NPL-MW-28S	603.83	11-21	05/20/2019	WLO	NM	10.73	593.10	Gauged Only									

Table 9. Cumulative Groundwater Analytical Results
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Wilcox Project Number: 341.14
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Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
							Residential Groundwater Tap Screening Levels	**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
							Residential Vapor Intrusion Groundwater Screening Levels	110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
							Commercial/Industrial Vapor Intrusion Groundwater Screening Levels	*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
NPL-MW-29S	603.98	13-23	09/18/2017	WLO	NM	16.40	587.58	Gauged Only									
NPL-MW-29S	603.98	13-23	12/05/2017	WLO	NM	17.24	586.74	Gauged Only									
NPL-MW-29S	603.98	13-23	03/19/2018	WLO	NM	15.24	588.74	Gauged Only									
NPL-MW-29S	603.98	13-23	05/29/2018	WLO	NM	14.86	589.12	Gauged Only									
NPL-MW-29S	603.98	13-23	08/27/2018	WLO	NM	16.93	587.05	Gauged Only									
NPL-MW-29S	603.98	13-23	11/26/2018	WLO	NM	16.38	587.60	Gauged Only									
NPL-MW-29S	603.98	13-23	05/20/2019	WLO	NM	13.15	590.83	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	09/18/2017	WLO	NM	13.65	590.10	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	12/05/2017	WLO	NM	14.63	589.12	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	03/19/2018	WLO	NM	13.16	590.59	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	05/29/2018	WLO	NM	12.21	591.54	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	08/27/2018	WLO	NM	14.11	589.64	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	11/26/2018	WLO	NM	13.92	589.83	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	05/20/2019	WLO	NM	10.89	592.86	Gauged Only									
NPL-MW-34S	603.67	13-23	09/18/2017	WLO	NM	15.87	587.80	Gauged Only									
NPL-MW-34S	603.67	13-23	03/19/2018	NA	NM	NA	NA	Not Sampled									
NPL-MW-34S	603.67	13-23	05/29/2018	WLO	NM	14.47	589.20	Gauged Only									
NPL-MW-34S	603.67	13-23	08/27/2018	WLO	NM	16.43	587.24	Gauged Only									
NPL-MW-34S	603.67	13-23	11/26/2018	WLO	NM	NA	NA	Not Sampled									
NPL-MW-34S	603.67	13-23	05/20/2019	WLO	NM	12.62	591.05	Gauged Only									
NPL-MW-35S	604.08	11-21	09/18/2017	WLO	NM	12.70	591.38	Gauged Only									
NPL-MW-35S	604.08	11-21	12/05/2017	WLO	NM	13.64	590.44	Gauged Only									
NPL-MW-35S	604.08	11-21	03/19/2018	WLO	NM	12.42	591.66	Gauged Only									
NPL-MW-35S	604.08	11-21	05/29/2018	WLO	NM	11.25	592.83	Gauged Only									
NPL-MW-35S	604.08	11-21	08/27/2018	WLO	NM	13.18	590.90	Gauged Only									
NPL-MW-35S	604.08	11-21	11/26/2018	WLO	NM	13.15	590.93	Gauged Only									
NPL-MW-35S	604.08	11-21	05/20/2019	WLO	NM	10.06	594.02	Gauged Only									
NPL-MW-36S	605.14	13-23	09/18/2017	WLO	NM	16.50	588.64	Gauged Only									
NPL-MW-36S	605.14	13-23	12/05/2017	WLO	NM	17.42	587.72	Gauged Only									
NPL-MW-36S	605.14	13-23	03/19/2018	WLO	NM	16.37	588.77	Gauged Only									
NPL-MW-36S	605.14	13-23	05/29/2018	WLO	NM	15.05	590.09	Gauged Only									
NPL-MW-36S	605.14	13-23	08/27/2018	WLO	NM	17.23	587.91	Gauged Only									
NPL-MW-36S	605.14	13-23	11/26/2018	WLO	NM	16.85	588.29	Gauged Only									
NPL-MW-36S	605.14	13-23	05/20/2019	WLO	NM	13.47	591.67	Gauged Only									

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water[1] (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
							Residential Groundwater Tap Screening Levels	**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
							Residential Vapor Intrusion Groundwater Screening Levels	110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
							Commercial/Industrial Vapor Intrusion Groundwater Screening Levels	*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
B-04	NA	NA	01/20/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
B-04	NA	NA	01/20/2015	FD	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
B-05	NA	NA	01/20/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	6.8	< 5.0	< 5.0	251
B-06	NA	NA	03/18/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-07	NA	NA	03/18/2015	N	NM	NA	NA	**7.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-08	NA	NA	03/18/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	48.6	< 5.0	< 5.0	< 100
B-08	NA	NA	03/18/2015	FD	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	**5.9**	53.6	< 5.0	< 5.0	< 100
B-09	NA	NA	09/25/2015	N	NM	NA	NA	**129**	< 5.0	10.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-10	NA	NA	09/25/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-11	NA	NA	09/25/2015	N	NM	NA	NA	**178**	< 5.0	8.6	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-11	NA	NA	09/25/2015	FD	NM	NA	NA	**228**	< 5.0	13.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-13	NA	NA	12/14/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-15	NA	NA	12/14/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-18	NA	NA	12/14/2015	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-37	NA	NA	01/07/2016	N	NM	NA	NA	**16.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-38	NA	NA	01/07/2016	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-39	NA	NA	01/07/2016	N	NM	NA	NA	**104**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-40	NA	NA	01/07/2016	N	NM	NA	NA	**5.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-41	NA	NA	01/07/2016	N	NM	NA	NA	**12.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-42	NA	NA	01/07/2016	N	NM	NA	NA	**9.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
B-43	NA	NA	01/07/2016	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 9. Cumulative Groundwater Analytical Results
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Free Product (feet below TOC)	Depth to Water(1) (feet below TOC)	Groundwater Elevation (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels								**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels								110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels								*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
B-44	NA	NA	01/07/2016	N	NM	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Notes:

(1) = Depth to water measurements are collected immediately prior to sample collection. Measurements may differ from the comprehensive gauging event conducted prior to the initiation of groundwater sampling activities.
N = Normal Field Sample
FD = Field Duplicate Sample
TOC = Top of Casing
WLO = Water Level Only
NA = Not Applicable
NE = Not Established
NM = Not Measured
µg/L = micrograms per liter
< = Analyte not detected at the specified detection level
Screening levels obtained from IDEM's Remediation Closure Guide (RCG) Table A-6, March 22, 2012, updated 2019
Bold values exceed IDEM RCG Residential Groundwater Tap Screening Levels
Underlined values exceed IDEM RCG Residential Vapor Intrusion Groundwater Screening Levels
Italicized values exceed IDEM RCG Commercial/Industrial Vapor Intrusion Groundwater Screening Levels

Table 10. Summary of Groundwater Geochemical Parameters Results
Former O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Monitoring Well ID	Screen Interval (ft bgs)	Date Sampled	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-01	6-16	9/14/2016	7.26	21.51	0.752	4.60	134	10.20
		11/22/2016	6.98	16.96	0.772	6.79	268	15.9
		2/3/2017	7.14	13.81	0.748	7.79	212	117
		5/3/2017	7.36	16.04	0.716	7.15	282	10
		9/19/2017	6.82	20.46	0.810	6.14	207	8.3
		12/6/2017	7.07	17.15	0.998	7.37	173	30.3
		3/20/2018	6.91	12.68	0.828	7.18	180	121
		5/30/2018	7.23	16.47	0.749	6.91	164	24.9
		8/29/2018	6.99	23.25	0.711	4.56	124	4.5
		11/27/2018	7.16	15.41	1.10	6.61	114	34.2
		2/21/2019	7.27	12.86	0.91	6.62	108.4	7.08
		5/21/2019	7.19	14.32	0.83	7.51	150.6	151.44
MW-02	6-16	9/12/2016	7.10	21.52	0.806	5.91	123	6.70
		11/21/2016	6.68	18.55	0.821	6.37	327	68.2
		2/1/2017	6.93	14.10	0.981	6.34	140	55.6
		5/2/2017	7.37	15.87	0.838	7.72	275	8
		9/18/2017	6.97	18.92	0.930	6.54	161	0
		12/5/2017	6.97	17.50	0.849	7.76	103	2.2
		3/19/2018	6.97	13.23	0.907	8.91	176	21.9
		8/27/2018	7.34	24.44	0.848	6.34	131	19.8
		11/26/2018	7.11	16.75	0.919	7.43	106	14
		2/20/2019	7.33	11.99	0.85	7.93	29.6	1.73
		5/20/2019	7.18	14.59	0.87	8.37	142.1	114.01
MW-03	6-16	9/13/2016	7.17	17.66	0.757	4.77	154	22.00
		11/21/2016	6.92	17.51	0.812	6.74	231	41.2
		2/2/2017	7.07	13.80	0.875	7.85	235	141
		5/3/2017	7.71	15.34	0.870	6.97	253	77
		9/18/2017	6.95	17.80	0.834	6.33	169	0
		12/5/2017	6.89	15.61	0.898	9.14	123	9.6
		3/19/2018	7.02	14.06	0.729	7.31	204	222
		5/29/2018	7.21	21.78	0.713	6.69	132	61.4
		8/29/2018	6.89	18.97	0.759	5.67	133	2.1
		11/26/2018	6.91	14.50	0.896	7.24	139	19.5
		2/20/2019	7.30	9.39	0.78	7.65	99.4	8.77
		5/20/2019	7.14	18.85	0.84	7.84	154.8	11.52
MW-04	6-16	9/14/2016	7.17	19.95	0.820	4.75	145	22.00
		11/22/2016	6.90	17.06	0.900	6.69	346	32.7
		2/3/2017	7.30	11.42	0.877	7.21	222	155
		5/3/2017	6.95	14.79	0.857	6.32	233	176
		9/19/2017	6.96	19.95	0.764	5.89	196	7.4
		12/6/2017	7.08	17.20	1.11	7.13	176	76.3
		3/20/2018	6.96	12.53	0.918	7.88	239	170
		5/30/2018	7.20	17.78	0.796	7.34	176	39.8
		8/27/2018	7.01	25.59	0.794	4.87	130	21.6
		11/27/2018	7.17	13.87	0.929	7.80	113	57.3
		2/21/2019	7.09	11.89	0.79	7.48	143.1	37.15
		5/21/2019	7.19	13.52	0.85	6.66	-90.8	1013.9
MW-05	6-16	9/12/2016	6.90	18.99	0.839	3.16	160	43.40
		11/21/2016	6.54	16.12	0.807	6.28	336	1000
		2/2/2017	6.89	12.33	1.04	5.96	216	137
		5/3/2017	6.94	14.49	0.875	6.75	200	224
		9/18/2017	7.00	20.00	0.768	5.14	180	40
		12/5/2017	6.95	16.24	0.833	6.69	122	7.4
		3/19/2018	6.93	13.49	0.901	7.64	167	87.9
		5/30/2018	6.80	16.87	0.865	8.09	156	79.7
		8/28/2018	6.91	18.57	0.796	6.08	137	0
		11/26/2018	7.15	16.37	0.816	7.08	98	31.4
		2/20/2019	7.26	12.40	0.88	7.44	65.3	177.67
		5/21/2019	7.20	13.88	0.83	7.91	208.5	269.12

Table 10. Summary of Groundwater Geochemical Parameters Results
Former O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Monitoring Well ID	Screen Interval (ft bgs)	Date Sampled	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-06	6-16	9/14/2016	7.15	23.32	1.05	3.70	136	22.0
		11/23/2016	6.66	17.70	0.834	6.44	350	1000
		2/3/2017	7.36	12.79	1.09	7.71	217	289
		5/4/2017	7.01	14.75	0.904	6.54	254	145
		9/20/2017	7.01	20.36	0.820	4.92	233	13
		12/7/2017	7.14	17.15	0.802	5.46	166	63.4
		3/21/2018	6.94	12.42	1.05	7.18	248	58.8
		5/31/2018	7.10	18.18	0.917	7.32	168	6.0
		8/30/2018	6.98	25.41	0.807	4.77	138	137
		11/28/2018	7.18	16.62	0.944	6.82	116	34.3
		2/21/2019	6.99	10.29	1.20	7.12	116.3	637.34
		5/22/2019	7.15	19.46	0.87	6.93	150.8	68.85
MW-07	6-16	9/13/2016	7.00	19.81	0.900	4.21	125	0
		11/22/2016	6.61	17.10	0.844	5.73	346	10.1
		2/2/2017	7.29	13.65	1.01	6.33	203	60.4
		5/3/2017	7.26	15.41	0.896	5.64	264	31
		9/18/2017	6.92	19.14	0.862	2.60	159	0
		12/5/2017	6.94	16.86	0.896	4.62	124	18.7
		3/19/2018	6.92	13.87	0.805	4.53	151	24.5
		5/30/2018	7.04	22.97	0.831	3.27	159	115
		8/27/2018	6.84	26.12	0.794	2.71	119	103
		11/26/2018	6.80	12.82	0.901	5.84	163	162
		2/20/2019	7.30	11.59	0.82	5.31	39.6	2.58
		5/21/2019	7.02	14.65	0.84	3.53	185.2	12.70
MW-08	6-16	9/14/2016	7.12	19.87	0.814	4.07	149	0.40
		11/23/2016	6.89	17.49	0.971	4.93	296	4.7
		2/3/2017	6.99	13.60	0.845	6.98	220	62.8
		5/3/2017	7.00	14.99	0.913	5.77	235	62.1
		9/19/2017	6.82	21.50	0.952	3.51	167	0.6
		5/31/2018	7.18	16.65	1.01	4.25	184	30.6
		7/31/2018	6.99	19.16	1.220	6.21	154	12.7
		8/28/2018	7.39	28.57	0.870	3.67	102	137
		11/27/2018	7.08	15.30	0.903	4.95	109	16.1
		2/21/2019	7.26	12.76	0.98	5.31	107.7	30.70
		5/22/2019	7.06	18.10	1.18	6.61	112.5	95.62
MW-09	6-16	9/14/2016	7.23	19.60	1.29	2.41	122	9.00
		11/23/2016	6.85	17.16	0.988	3.77	351	169
		2/3/2017	7.12	14.55	0.869	6.21	218	95.1
		5/4/2017	7.17	16.15	0.841	6.42	287	14
		9/20/2017	6.97	15.34	1.04	4.01	219	3
		12/7/2017	7.12	14.09	0.860	3.75	168	49.7
		3/21/2018	6.95	13.29	0.866	6.03	185	5.0
		5/31/2018	7.29	19.62	0.819	5.57	183	24.4
		7/30/2018	7.06	17.11	0.927	6.21	132	650
		8/29/2018	7.47	28.68	1.08	0	12	108
		11/28/2018	6.90	15.13	1.03	6.61	161	92.5
		2/22/2019	6.83	11.46	0.94	5.54	171.6	45.93
		5/23/2019	7.13	19.04	1.06	4.83	213.3	190.65
MW-09D	32.5-37.5	9/20/2017	7.08	18.57	1.12	0.62	225	0
		12/7/2017	7.18	14.07	0.843	1.09	166	415
		3/21/2018	6.97	15.20	0.881	2.84	179	164
		5/31/2018	7.18	18.16	0.795	0.49	165	253
		7/30/2018	6.97	15.72	0.808	0.71	130	16.5
		8/27/2018	7.21	27.29	0.696	2.74	-17	181
		11/28/2018	6.93	14.15	0.907	0.27	153	376
		2/22/2019	6.68	14.21	0.88	0.53	139.5	18.53
		5/23/2019	7.00	23.83	0.78	0.57	177.1	305.37

Table 10. Summary of Groundwater Geochemical Parameters Results
Former O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Monitoring Well ID	Screen Interval (ft bgs)	Date Sampled	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-10	6-16	9/14/2016	7.06	20.01	1.08	5.41	147	7.40
		11/22/2016	6.84	17.69	1.32	6.20	280	1000
		2/2/2017	7.35	15.04	1.03	6.84	217	30.7
		5/3/2017	7.84	17.15	0.957	7.16	278	14
		9/19/2017	6.89	20.58	1.11	5.55	195	27
		12/7/2017	7.12	16.97	0.938	5.92	157	74.3
		3/21/2018	6.97	11.13	0.902	7.54	178	766
		5/31/2018	7.03	17.06	0.969	8.20	184	4.0
		7/30/2018	6.98	18.84	1.220	7.64	119	9.2
		8/28/2018	7.27	7.27	1.11	0	-77	303
		11/27/2018	7.07	16.25	0.942	1.59	95	13.0
		2/21/2019	6.88	14.45	1.70	4.71	103.9	60.87
		5/22/2019	7.07	18.05	1.04	6.60	72.8	33.93
MW-11	6-16	9/13/2016	6.89	22.89	1.10	4.01	134	10.10
		11/21/2016	6.72	19.28	1.11	5.73	24.9	137
		2/2/2017	7.06	14.06	1.07	7.43	222	51.0
		5/3/2017	6.98	15.72	0.925	7.50	212	208
		9/18/2017	6.76	22.23	1.14	4.59	153	0
		12/5/2017	6.77	19.01	1.04	6.17	126	16.8
		3/19/2018	6.84	14.02	0.892	8.6	166	10.7
		5/30/2018	6.69	18.27	1.08	9.20	170	19.6
		7/31/2018	6.87	21.29	1.080	7.44	147	9.5
		8/28/2018	7.16	25.46	0.970	4.55	106	0
		11/26/2018	6.79	17.54	1.02	6.37	109	14.5
		2/20/2019	7.28	7.77	0.22	9.76	72.0	334.74
		5/21/2019	6.93	13.90	1.15	7.51	163.2	95.90
MW-12	6-16	9/14/2016	7.06	19.38	0.779	3.97	153	87.00
		11/22/2016	6.87	14.39	0.907	6.17	279	441
		2/2/2017	6.90	14.36	0.856	3.01	212	214
		5/3/2017	7.40	15.96	0.811	7.13	277	89
		9/18/2017	6.82	20.13	0.894	4.25	143	1
		12/5/2017	6.94	15.15	0.890	8.37	123	153
		3/19/2018	6.87	15.12	0.774	5.79	161	116
		5/30/2018	7.02	20.34	0.801	5.44	168	123
		8/28/2018	6.69	23.16	0.791	3.89	132	37.6
		11/27/2018	7.06	14.60	0.862	4.00	120	51.5
		2/20/2019	7.18	11.30	0.74	6.05	20.5	57.25
		5/21/2019	7.73	14.35	0	10.20	147.6	0.08
MW-13	6-16	9/13/2016	6.91	19.76	0.900	0.48	112	167
		11/22/2016	6.65	16.28	0.940	1.24	349	72.0
		2/2/2017	7.25	14.30	1.00	6.67	199	68.8
		5/3/2017	6.79	14.79	0.924	2.51	225	31.9
		9/19/2017	6.71	21.12	0.891	0.11	64.0	8.8
		12/7/2017	6.88	16.56	1.03	1.24	165	62.7
		3/20/2018	6.80	12.86	0.961	0.49	102	35.2
		5/30/2018	7.05	15.68	0.892	0.57	-69	5.6
		8/29/2018	6.68	21.61	0.990	0.15	93	34.5
		11/28/2018	6.72	14.46	1.09	0.84	43	19.1
		2/21/2019	7.12	13.05	0.93	0.64	88.8	1.31
		5/22/2019	6.93	16.92	1.18	0.44	-12.5	12.28
MW-14	6-16	9/13/2016	6.82	22.01	0.748	1.67	105	81.30
		11/22/2016	6.63	16.97	0.841	3.29	2.83	29.7
		2/2/2017	6.68	13.25	0.877	3.06	217	121
		5/3/2017	6.78	15.56	0.827	3.69	213	32.6
		9/19/2017	6.79	20.90	0.208	8.03	171	2
		12/6/2017	6.88	18.15	0.824	2.54	122	321
		3/20/2018	6.77	12.30	0.797	4.20	193	47.9
		5/30/2018	6.90	16.40	0.772	4.65	149	9.3
		8/29/2018	6.77	24.81	0.645	2.05	127	57
		11/27/2018	6.70	15.19	0.901	2.96	263	459
		2/21/2019	6.62	14.20	0.91	4.35	90.9	245.03
		5/21/2019	7.01	13.90	0.75	4.46	149.7	121.22

Table 10. Summary of Groundwater Geochemical Parameters Results
Former O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Monitoring Well ID	Screen Interval (ft bgs)	Date Sampled	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-15	6-16	9/14/2016	7.05	19.72	0.783	4.24	156	0
		11/23/2016	7.01	16.60	0.781	4.82	359	1000
		2/3/2017	7.40	12.25	0.850	11.41	215	157
		5/4/2017	7.01	14.62	0.836	4.91	275	1000
		9/20/2017	6.91	20.70	0.748	3.87	213	25
		12/7/2017	6.90	16.29	0.893	5.50	110	17.5
		3/21/2018	6.86	12.92	0.763	5.52	216	39.8
		5/31/2018	7.19	20.17	0.655	4.84	171	1000
		7/30/2018						
		8/30/2018	7.29	22.88	0.778	4.42	159	18.2
		11/28/2018	6.91	11.62	0.919	5.53	176	272
		2/22/2019	6.65	12.11	0.90	5.87	135.9	68.76
		5/23/2019	6.77	23.88	0.82	5.90	196.2	121.32
MW-15D	30-35	9/20/2017	6.85	18.18	0.873	0	217	40
		12/7/2017	6.84	16.42	0.958	0	-37	5.1
		3/21/2018	6.84	14.93	0.802	1.06	234	102
		5/31/2018	7.08	18.49	0.774	0	165	94.6
		7/30/2018	6.92	17.73	0.820	0.05	142	1000
		8/30/2018	7.22	18.89	0.762	0	117	57.6
		11/28/2018	6.87	13.45	0.859	0.32	134	118
		2/22/2019	6.56	13.31	0.94	3.46	131.6	218.40
		5/23/2019	6.96	21.75	0.84	0.63	155	39.38
MW-16	6-16	9/14/2016	7.05	17.35	0.813	4.26	146	2.70
		11/22/2016	7.31	12.24	0.787	6.17	342	1000
		2/3/2017	6.97	12.81	0.810	5.29	218	87.7
		5/4/2017	7.12	16.50	0.822	6.53	272	24
		9/19/2017	6.77	20.51	0.882	4.19	156	0
		12/6/2017	7.01	17.12	0.811	4.41	120	3.2
		3/21/2018	6.83	13.23	0.759	7.81	256	53.6
		5/31/2018	7.13	17.09	0.870	7.13	176	8.3
		7/31/2018	7.00	19.19	0.879	6.24	124	220
		8/29/2018	6.73	18.97	0.781	4.36	155	36.4
		11/27/2018	7.09	15.35	0.730	5.37	104	14.5
		2/21/2019	6.91	13.65	0.85	6.61	76.9	415.63
		5/23/2019	7.03	21.77	0.85	6.99	186	109.19
MW-17	6-16	9/14/2016	7.01	18.95	0.755	4.27	146	0
		11/22/2016	6.71	16.30	0.742	6.65	333	650
		2/3/2017	7.41	11.80	0.813	7.53	212	241
		5/3/2017	7.47	15.51	0.879	6.37	283	21
		9/19/2017	6.87	20.00	0.812	3.77	194	4
		12/6/2017	7.03	16.74	0.800	4.64	136	86.5
		3/20/2018	6.88	12.66	0.790	7.36	177	10.1
		5/30/2018	6.97	17.46	0.864	7.75	164	22.8
		7/30/2018	6.90	19.89	0.885	7.56	196	164
		8/28/2018	7.20	21.55	0.763	5.31	112	5.1
		11/28/2018	6.90	15.05	0.822	6.86	236	34.8
		5/22/2019	7.04	16.71	1.09	6.61	178.7	16.88
MW-18	10-20	9/13/2016	6.98	19.60	0.771	3.43	124	7.50
		11/22/2016	6.89	16.25	0.927	7.01	277	500
		2/2/2017	7.27	15.24	0.913	9.27	220	219
		5/4/2017	6.90	16.19	0.936	5.28	280	57
		9/20/2017	6.86	19.71	0.804	5.70	199	30.5
		12/7/2017	6.90	17.21	0.977	6.46	133	13.1
		3/21/2018	6.82	9.95	0.948	13.70	189	90.2
		5/31/2018	7.01	17.97	0.814	7.71	188	12.3
		8/30/2018	6.91	19.69	0.824	5.60	134	6.2
		11/27/2018	6.78	14.81	0.963	7.92	280	46.1
		2/21/2019	7.18	13.46	0.85	7.43	98.0	58.74
		5/22/2019	7.04	17.22	0.89	7.37	143.7	48.40

Table 10. Summary of Groundwater Geochemical Parameters Results
Former O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Monitoring Well ID	Screen Interval (ft bgs)	Date Sampled	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-19	10-20	9/14/2016	7.06	18.75	0.919	3.56	138	8.70
		11/23/2016	6.82	15.41	0.905	6.07	301	114
		2/3/2017	7.15	12.25	0.871	6.15	225	79.2
		5/4/2017	6.92	15.91	0.909	5.37	266	337
		9/20/2017	6.80	20.33	1.11	4.84	214	0
		12/7/2017	6.96	16.38	0.881	6.24	139	146
		3/21/2018	6.87	13.79	0.865	6.54	236	37.8
		5/31/2018	7.05	18.21	0.973	6.29	140	9.9
		7/30/2018	6.93	19.38	1.050	4.48	155	1000
		8/29/2018	7.24	21.72	0.846	6.33	149	11.4
		11/28/2018	7.08	15.72	0.899	6.54	116	49.3
		2/22/2019	7.07	11.39	0.94	6.60	132.2	26.18
		5/23/2019	6.85	22.46	1.55	6.65	194.8	182.96
MW-20	10-20	9/12/2016	6.92	17.42	1.02	1.25	143	10.80
		11/21/2016	6.77	16.20	0.969	5.90	264	314
		2/1/2017	7.40	15.90	0.865	4.15	170	52.9
		5/4/2017	6.90	15.74	0.868	6.42	225	193
		9/20/2017	6.76	18.50	1.17	2.91	212	21.4
		12/7/2017	6.97	15.47	1.00	3.73	168	50.1
		3/21/2018	6.82	13.43	0.924	7.27	189	6.5
		5/31/2018	7.15	17.16	0.872	6.20	195	33.2
		8/30/2018	6.85	18.08	0.901	2.50	143	13.5
		11/28/2018	7.05	15.65	0.949	5.04	124	16.8
		2/21/2019	6.84	13.53	0.95	6.17	95.2	74.60
		5/22/2019	6.86	18.52	1.20	5.97	134.7	239.91
MW-21	10-20	9/12/2016	6.88	16.57	0.884	1.25	126	218
		11/21/2016	6.35	16.59	0.969	0.71	321	107
		2/1/2017	6.67	14.84	0.880	1.78	128	92.5
		5/2/2017	6.78	15.71	0.849	3.65	226	174
		9/19/2017	6.69	16.18	0.994	1.04	185	32
		12/6/2017	6.85	11.41	1.12	2.05	63	151
		3/20/2018	6.72	12.58	0.810	4.55	260	232
		5/30/2018	6.81	20.05	0.864	2.42	147	90.4
		8/28/2018	6.56	21.98	0.927	0.76	138	269
		11/27/2018	6.75	13.54	0.941	1.38	344	473
		2/20/2019	7.15	13.12	0.74	1.17	38.3	118.64
		5/22/2019	6.87	16.32	0.95	1.70	201.8	1070.2
MW-22	10-20	9/12/2016	7.01	17.16	0.903	2.35	151	40.10
		11/23/2016	6.82	16.27	0.934	5.70	297	99.9
		2/2/2017	7.00	14.33	0.924	6.35	230	1000
		5/4/2017	6.93	15.22	0.895	5.43	270	1000
		9/20/2017	6.74	22.90	0.820	4.88	219	58.6
		12/7/2017	6.90	16.34	1.00	4.96	167	131
		3/21/2018	6.86	7.41	0.889	14.36	178	171
		5/31/2018	7.13	16.91	0.818	5.60	192	73.6
		8/30/2018	6.68	17.50	0.905	5.12	164	44.8
		11/28/2018	7.03	16.18	0.900	5.81	122	34.6
		2/22/2019	7.06	12.74	0.91	6.13	121.3	63.37
		5/23/2019	7.09	21.64	1.25	7.11	192	279.06
MW-23	10-20	9/13/2016	7.04	17.14	0.724	5.14	125	96.20
		11/21/2016	6.82	17.19	0.814	5.67	236	9.2
		2/1/2017	6.84	14.32	0.804	4.72	145	91.4
		5/2/2017	7.05	17.50	0.741	6.92	220	648
		9/18/2017	6.65	19.66	0.709	5.08	175	1.7
		12/6/2017	6.88	15.99	0.827	5.51	142	0
		3/20/2018	6.91	12.38	0.796	6.51	136	58.7
		5/30/2018	7.04	17.47	0.661	6.95	181	72.1
		8/28/2018	6.85	20.74	0.754	4.57	134	0
		11/27/2018	6.67	12.73	0.985	9.09	308	143
		5/22/2019	7.06	16.19	0.73	7.31	168.7	9.93

Table 10. Summary of Groundwater Geochemical Parameters Results
Former O'Neal's Clothes Depot Cleaners -- Martinsville, Indiana
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Monitoring Well ID	Screen Interval (ft bgs)	Date Sampled	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-24	10-20	9/14/2016	7.04	17.53	0.926	4.04	125	52.2
		11/23/2016	6.60	16.84	0.929	5.37	348	7.9
		2/3/2017	6.98	14.14	0.940	4.88	182	205
		9/20/2017	6.73	21.71	0.948	3.83	223	51.2
		12/7/2017	7.08	14.30	0.998	7.37	176	97
		3/21/2018	6.86	14.17	0.841	5.65	240	130
		5/31/2018	6.93	19.18	0.933	5.93	150	34.8
		7/30/2018	6.85	20.74	0.709	5.51	164	119
		8/30/2018	6.79	21.52	0.940	6.77	177	119
		11/28/2018	7.00	16.35	1.03	5.50	120	24.9
		2/20/2019	7.12	13.08	0.88	5.47	117.8	13.82
		5/23/2019	6.97	21.73	1.29	6.07	179.2	102.04
MW-25	10-20	9/13/2016	6.97	19.63	0.835	4.03	136	8.60
		11/21/2016	6.45	16.99	0.828	4.63	301	89.2
		2/1/2017	7.48	16.09	0.763	5.06	186	72.1
		5/2/2017	7.52	15.74	0.653	6.95	266	69.2
		9/19/2017	6.84	20.98	0.727	5.57	192	0
		12/6/2017	6.91	18.89	0.910	4.57	89	348
		3/20/2018	7.05	13.44	0.777	11.34	234	38.8
		5/30/2018	7.37	17.29	0.649	8.89	158	23.1
		8/28/2018	6.97	21.57	0.697	4.47	125	0
		11/27/2018	6.88	14.77	0.805	6.69	279	43.0
		2/20/2019	7.49	13.19	0.36	8.04	33.4	0.76
		5/22/2019	7.42	16.08	0.71	9.57	158.9	150.47
MW-26	7-17	9/14/2016	7.20	21.64	0.942	3.95	128	46.50
		2/3/2017	6.99	13.26	0.983	5.15	210	84.2
		9/20/2017	6.77	24.47	0.864	4.30	216	5.9
		12/7/2017	7.01	14.20	0.810	7.39	101	5.7
		5/31/2018	7.11	26.62	0.704	5.63	140	34.7
		7/31/2018	6.89	20.37	0.835	3.65	21	143
		8/29/2018	7.03	21.61	0.861	2.25	135	48.2
		11/28/2018	7.10	16.57	0.879	5.84	114	161
		2/22/2019	7.07	9.97	1.06	6.99	129.5	34.99
MW-27	10-20	9/19/2017	6.69	20.87	1.31	3.01	131	43.5
		12/6/2017	6.88	19.54	0.935	3.35	117	845
		3/20/2018	6.71	12.56	0.993	4.55	97	61.9
		5/30/2018	6.77	21.88	0.966	2.29	-61	236
		8/29/2018	6.82	22.63	0.862	3.33	116	109
		11/27/2018	6.75	14.39	1.06	4.37	282	206
		2/20/2019	7.14	13.00	0.86	4.82	45.1	39.29
		5/22/2019	7	21.32	1	5.55	109.3	832.38
MW-28	10-20	9/19/2017	6.76	18.98	0.954	4.49	204	0
		12/6/2017	6.90	18.60	0.907	3.29	139	71000
		3/20/2018	6.79	13.04	0.883	5.81	237	277
		5/30/2018	6.81	16.46	0.939	6.94	139	27.2
		8/29/2018	6.72	20.18	0.839	4.67	134	6.5
		11/27/2018	6.98	16.00	0.875	5.35	113	37.6
		2/21/2019	7.24	12.32	0.86	5.71	53.9	16.68
		5/20/2019	6.94	18.42	0.74	5.14	151.1	273.91
MW-29	10-20	9/19/2017	6.95	18.88	0.780	3.25	212	46
		12/6/2017	6.96	16.77	0.834	4.60	115	0
		3/20/2018	6.93	12.55	0.699	5.76	158	432
		5/30/2018	7.16	16.79	0.631	7.79	187	428
		8/27/2018	6.90	20.59	0.704	3.53	132	167
		8/29/2018	6.90	20.59	0.704	3.53	132	167
		11/27/2018	7.13	15.83	0.704	5.19	107	85.9
		2/20/2019	6.75	11.13	0.70	6.08	124.7	148.03
		5/21/2019	7.17	14.45	0.57	8.25	172.2	531.48

Table 11. Cumulative Vapor Intrusion Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Sample Address	Sample Location	Sample Name	Date Sampled	Sample Type	Tetrachloroethene (ug/m3)	Trichloroethene (ug/m3)	cis-1,2-Dichloroethene (ug/m3)	trans-1,2-Dichloroethene (ug/m3)	Vinyl chloride (ug/m3)
				Residential Indoor Air Screening Levels	**42**	**2.1**	**NE**	**NE**	**1.7**
				Residential Sub-Slab Screening Levels	1,400	70	NE	NE	56.7
39 South Ohio	Sub-Slab	DUP-01_SG_170926	9/26/2017	FD	**293**	< 0.74	< 1.1	< 1.1	< 0.70
	1st Floor Indoor Air	39O_IA-2_AA_170926	9/26/2017	N	< 1.0	< 0.82	< 1.2	< 1.2	< 0.77
	Basement Indoor Air	39O_IA-1_AA_170926	9/26/2017	N	< 0.96	0.92	< 1.1	< 1.1	< 0.72
	Crawl Space Indoor Air	39O_CSA-1_AA_170926	9/26/2017	N	< 0.96	< 0.76	< 1.1	< 1.1	< 0.72
	Sub-Slab	39O_SS-1_SG_170926	9/26/2017	N	**266**	< 0.74	< 1.1	< 1.1	< 0.70
	Sub-Slab	DUP-01_SG_180307	3/7/2018	FD	< 0.92	< 0.73	< 1.1	< 1.1	< 0.35
	Sub-Slab	39O_SS-01_SG_180307	3/8/2018	N	< 0.92	< 0.73	< 1.1	< 1.1	< 0.35
	Basement Indoor Air	39O_IA-01_AA_180307	3/8/2018	N	< 1.0	< 0.80	< 1.2	< 1.2	< 0.38
	Crawl Space Indoor Air	39O_CSA-01_AA_180307	3/8/2018	N	< 1.1	< 0.88	< 1.3	< 1.3	< 0.42
	1st Floor Indoor Air	39O_IA-02_AA_180307	3/8/2018	N	< 1.0	< 0.80	< 1.2	< 1.2	< 0.38
40 North Colfax	Crawl Space	40C_CSA-1_AA_170324	3/24/2017	N	18.2	< 0.76	< 1.1	< 1.1	< 0.36
	Crawl Space	DUP-01_AA_170324	3/24/2017	FD	16.9	< 0.76	< 1.1	< 1.1	< 0.36
	Indoor Air	40C_1A-1_AA_170324	3/24/2017	N	15.6	< 0.82	< 1.2	< 1.2	< 0.39
	Crawl Space	40C_CSA-1_AA_170831	8/31/2017	N	2.5	< 0.79	< 1.2	< 1.2	< 0.37
	Indoor Air	40C_IA-1_AA_170831	8/31/2017	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
40 South Ohio	Basement Indoor Air	40O_IA-1_AA_170906	9/6/2017	N	2.2	< 0.82	< 1.2	< 1.2	< 0.39
	Crawl Space Air	40O_CSA-1_AA_170906	9/6/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	Sub-slab	40O_SS-1_SG_170906	9/6/2017	N	**230**	< 0.79	< 1.2	< 2.9	< 0.75
	1st Floor Indoor Air	40O_IA-2_AA_170906	9/6/2017	N	2.0	**13.5**	< 1.5	< 1.5	< 0.47
	Basement Indoor Air	40O_IA-01_AA_180308	3/9/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	1st Floor Indoor Air	40O_IA-02_AA_180308	3/9/2018	N	< 1.1	< 0.88	< 1.3	< 1.3	< 0.42
	Crawl Space Air	40O_CSA-01_AA_180308	3/9/2018	N	< 1.0	< 0.80	< 1.2	< 1.2	< 0.38
	Sub-slab	40O_SS-01_SG_180308	3/9/2018	N	25.1	< 0.80	< 1.2	< 1.2	< 0.38
60 South Ohio	Sub-slab	DUP-01_SG_170906	9/6/2017	FD	7.5	< 0.74	< 1.1	< 2.7	< 0.70
	1st Floor Indoor Air	60O_IA-2_AA_170906	9/6/2017	N	< 2.0	< 0.79	< 1.2	< 2.9	< 0.75
	Basement Indoor Air	60O_IA-1_AA_170906	9/6/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	Sub-slab	60O_SS-1_SG_170906	9/6/2017	N	6.7	1.4	< 1.1	< 2.7	< 0.70
	Crawl Space Air	60O_CSA-1_AA_170906	9/6/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	2nd Floor Indoor Air	60O_IA-3_AA_170906	9/6/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	Sub-slab	DUP-01_SG_180305	3/5/2018	FD	3.4	< 0.71	< 1.0	< 1.0	< 0.34
	1st Floor Indoor Air	60O_IA-02_AA_180305	3/6/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	Basement Indoor Air	60O_IA-01_AA_180305	3/6/2018	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
	Sub-slab	60O_SS-01_SG_180306	3/6/2018	N	< 1.8	< 0.73	< 1.1	< 1.1	< 0.35
	2nd Floor Indoor Air	60O_IA-03_AA_180305	3/6/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	Crawl Space Air	60O_CSA-01_AA_180305	3/6/2018	N	1.0	< 0.79	< 1.2	< 1.2	< 0.37
659 East Washington	1st Floor Indoor Air	659W_IA-2_AA_170324	3/24/2017	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
	Basement Indoor Air	659W_IA-1_AA_170324	3/24/2017	N	6.4	< 0.82	< 1.2	< 1.2	< 0.39
	Basement Indoor Air	DUP-02_AA_170324	3/24/2017	FD	8.7	< 0.76	< 1.1	< 1.1	< 0.36
	Basement Sub-Slab	659W-SS-1_SG_170324	3/24/2017	N	**82.7**	**7.0**	< 1.2	< 1.2	< 0.39
	1st Floor Indoor Air	1A-2_AA_180827	8/28/2018	N	1.6	< 0.86	< 1.3	< 1.3	< 0.41
	Basement Indoor Air	1A-1_AA_180827	8/28/2018	N	1.6	< 0.85	< 1.2	< 1.2	< 0.40
	Basement Sub-Slab	DUP-1_SG_180827	8/28/2018	FD	21.6	< 0.81	< 1.2	< 1.2	< 0.39
	Basement Sub-Slab	SS-1_AA_180827	8/28/2018	N	19.3	< 0.81	< 1.2	< 1.2	< 0.39
660 Jackson	1st Floor Indoor Air	660J_IA-1_AA_170912	9/12/2017	N	< 2.0	< 0.79	< 1.2	< 2.9	< 0.75
	Sub-Slab	660J_SS-1_SG_170912	9/12/2017	N	32.2	< 0.76	< 1.1	< 2.8	< 0.72
	2nd Floor Indoor Air	660J_IA-2_AA_170912	9/12/2017	N	< 2.1	< 0.82	< 1.2	< 3.0	< 0.77
	1st Floor Indoor Air	660J_IA-01_AA_180305	3/6/2018	N	2.3	< 0.86	< 1.3	< 1.3	< 0.41
	Sub-Slab	660J_SS-01_SG_180305	3/6/2018	N	4.4	< 0.83	< 1.2	< 1.2	< 0.40

Table 11. Cumulative Vapor Intrusion Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Sample Address	Sample Location	Sample Name	Date Sampled	Sample Type	Tetrachloroethene (ug/m3)	Trichloroethene (ug/m3)	cis-1,2-Dichloroethene (ug/m3)	trans-1,2-Dichloroethene (ug/m3	Vinyl chloride (ug/m3)
			Residential Indoor Air Screening Levels		**42**	**2.1**	**NE**	**NE**	**1.7**
740 East Washington	1st Floor Indoor Air	740W_IA-1_AA_170324	3/24/2017	N	**68.3**	< 0.82	< 1.2	< 1.2	< 0.39
	2nd Floor Indoor Air	740W_IA-2_AA_170324	3/24/2017	N	21.2	< 0.85	< 1.3	< 1.3	< 0.40
	Crawl Space	740W_CSA-1_AA_170324	3/24/2017	N	**60.6**	< 0.82	< 1.2	< 1.2	< 0.39
	1st Floor Sub-Slab	740W_SS-1_SG_170324	3/24/2017	N	**12,000 A3,1M**	**22.9**	< 1.1	< 1.1	< 0.35
	1st Floor Sub-Slab	DUP-03_SG_170324	3/24/2017	FD	**12,400 A3**	**27.5**	< 1.1	< 1.1	< 0.36
	1st Floor Indoor Air	740W_IA-1_AA_170831	8/31/2017	N	26.2	< 0.76	< 1.1	< 1.1	< 0.36
	1st Floor Sub-Slab	740W_SS-1_SG_170831	8/31/2017	N	**1,310 E**	**8.5**	< 1.1	< 1.1	< 0.35
	2nd Floor Indoor Air	740W_IA-2_AA_170831	8/31/2017	N	12.8	< 0.76	< 1.1	< 1.1	< 0.36
	Crawl Space	740W_CSA-1_AA_170831	8/31/2017	N	39.7	< 0.76	< 1.1	< 1.1	< 0.36
	Crawl Space	740W_DUP-01_AA_180515	5/15/2018	FD	3.6	< 0.85	< 1.2	< 1.2	< 0.40
	1st Floor Indoor Air	740W_IA-01_AA_180515	5/15/2018	N	1.5	< 0.85	< 1.2	< 1.2	< 0.40
	2nd Floor Indoor Air	740W_IA-02_AA_180515	5/15/2018	N	1.3	< 0.85	< 1.2	< 1.2	< 0.40
	Crawl Space	740W_CSA-01_AA_180515	5/15/2018	N	3.8	< 0.83	< 1.2	< 1.2	< 0.40
	Ambient Air	740WAA-01_AA_180515	5/15/2018	N	< 1.5	< 1.2	< 1.8	< 1.8	< 0.57
759 East Washington	Sub-Slab	DUP-01_SG_170912	9/12/2017	FD	**79.8**	< 0.76	< 1.1	< 2.8	< 0.72
	1st Floor Indoor Air	759W_IA-2_AA_170912	9/12/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	2nd Floor Indoor Air	759W_IA-3_AA_170912	9/12/2017	N	< 2.1	< 0.82	< 1.2	< 3.0	< 0.77
	Basement Indoor Air	759W_IA-1_AA_170912	9/12/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	Crawl Space Indoor Air	759W_CSA-1_AA_170912	9/12/2017	N	< 2.0	< 0.79	< 1.2	< 2.9	< 0.75
	Sub-Slab	759W_SS-1_SG_170912	9/12/2017	N	**90.6**	< 0.76	< 1.1	< 2.8	< 0.72
	1st Floor Indoor Air	759W_IA-02_AA_180314	3/15/2018	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
	2nd Floor Indoor Air	759W_IA-03_AA_180314	3/15/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	Basement Indoor Air	759W_IA-01_AA_180314	3/15/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	Crawl Space Indoor Air	759W_CSA-01_AA_180314	3/15/2018	N	< 1.0	< 0.80	< 1.2	< 1.2	< 0.38
	Sub-Slab	759W_SS-01_SG_180314	3/15/2018	N	8.4	< 0.81	< 1.2	< 1.2	< 0.39
760 East Washington	1st Floor Indoor Air	760W_IA-1_AA_170324	3/24/2017	N	14.4	< 0.82	< 1.2	< 1.2	< 0.39
	2nd Floor Indoor Air	760W_IA-2_AA_170324	3/24/2017	N	10	< 0.82	< 1.2	< 1.2	< 0.39
	Crawl Space/Basement Indoor Air	760W_CSA-1_AA_170324	3/24/2017	N	4.5	< 0.82	< 1.2	< 1.2	< 0.39
	Basement Sub-Slab	760W_SS-1_SG_170324	3/24/2017	N	**4,450 A3,1M**	< 0.82	< 1.2	< 1.2	< 0.39
	Basement Sub-Slab	DUP-04_SG_170324	3/24/2017	FD	**4,480 A3,1M**	< 0.85	< 1.3	< 1.3	< 0.40
	Crawl Space/Basement Indoor Air	760W_CSA-1_AA_170831	8/31/2017	N	16.6	< 0.79	< 1.2	< 1.2	< 0.37
	1st Floor Indoor Air	760W_IA-1_AA_170831	8/31/2017	N	17.3	< 0.79	< 1.2	< 1.2	< 0.37
	Basement Sub-Slab	760W_SS-1_SG_170831	8/31/2017	N	**1,180 E**	< 0.79	< 1.2	< 1.2	< 0.37
	2nd Floor Indoor Air	760W_IA-2_AA_170831	8/31/2017	N	7.5	< 0.79	< 1.2	< 1.2	< 0.37
	2nd Floor Indoor Air	760W_IA-3_AA_170831	8/31/2017	N	5.0	< 0.79	< 1.2	< 1.2	< 0.37
	2nd Floor Indoor Air	760W_IA-03_AA_180314	3/15/2018	N	6.3	< 0.85	< 1.2	< 1.2	< 0.40
	2nd Floor Indoor Air	760W_IA-02_AA_180314	3/15/2018	N	6.0	< 0.83	< 1.2	< 1.2	< 0.40
	1st Floor Indoor Air	760W_IA-01_AA_180314	3/15/2018	N	16.2	< 0.83	< 1.2	< 1.2	< 0.40
	Crawl Space/Basement Indoor Air	760W_CSA-01_AA_180314	3/15/2018	N	3.2	< 0.77	< 1.1	< 1.1	< 0.37
	Basement Sub-Slab	760W_SS-01_SG_180314	3/15/2018	N	**486**	< 0.90	< 1.3	< 1.3	< 0.43
89 South Ohio	1st Floor Indoor Air	89O_IA-2_AA_170912	9/12/2017	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
	2nd Floor Indoor Air	89O_IA-3_AA_170912	9/12/2017	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
	Basement Indoor Air	89O_IA-1_AA_170912	9/12/2017	N	< 1.0	< 0.82	< 1.2	< 1.2	< 0.39
	Crawl Space Indoor Air	89O_CSA-1_AA_170912	9/12/2017	N	< 2.0	< 0.79	< 1.2	< 2.9	< 0.75
	Sub-Slab	89O_SS-1_SG_170912	9/12/2017	N	4.0	< 0.79	< 1.2	< 2.9	< 0.75
	Sub-Slab	DUP-01_SG_180314	3/14/2018	FD	< 1.5	< 1.2	< 1.7	< 1.7	< 0.55
	1st Floor Indoor Air	89O_IA-02_AA_180314	3/15/2018	N	< 1.0	< 0.83	< 1.2	< 1.2	< 0.40
	2nd Floor Indoor Air	89O_IA-03_AA_180314	3/15/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	Basement Indoor Air	89O_IA-01_AA_180314	3/15/2018	N	< 0.96	< 0.76	< 1.1	< 1.1	< 0.36
	Crawl Space Indoor Air	89O_CSA-01_AA_180314	3/15/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
	Sub-Slab	89O_SS-01_SG_180314	3/15/2018	N	< 1.5	< 1.2	< 1.7	< 1.7	< 0.55
90 South Ohio	1st Floor Indoor Air	90O_IA-2_AA_170911	9/11/2017	N	2.2	< 0.76	< 1.1	< 2.8	< 0.72
	Basement Indoor Air	90O_IA-1_AA_170911	9/11/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	Crawl Space Indoor Air	90O_CSA-1_AA_170911	9/11/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
	1st Floor Indoor Air	90O_IA-02_AA_180305	3/6/2018	N	< 1.0	< 0.80	< 1.2	< 1.2	< 0.38
	Crawl Space Indoor Air	90O_CSA-01_AA_180305	3/6/2018	N	< 1.1	< 0.85	< 1.2	< 1.2	< 0.40
	Basement Indoor Air	90O_IA-01_AA_180305	3/6/2018	N	< 0.52	< 0.41	< 0.60	< 0.60	< 0.20

Table 11. Cumulative Vapor Intrusion Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Sample Address	Sample Location	Sample Name	Date Sampled	Sample Type	Tetrachloroethene (ug/m3)	Trichloroethene (ug/m3)	cis-1,2-Dichloroethene (ug/m3)	trans-1,2-Dichloroethene (ug/m3	Vinyl chloride (ug/m3)
			Residential Indoor Air Screening Levels		**42**	**2.1**	**NE**	**NE**	**1.7**
659 East Washington	Ambient Air	AA-1_AA_170324	3/24/2017	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
American Legion Shelter	Ambient Air	AA-2_AA_170324	3/24/2017	N	9.2	< 0.76	< 1.1	< 1.1	< 0.36
40 North Colfax	Ambient Air	AA-1_AA_170831	8/31/2017	N	< 0.99	< 0.79	< 1.2	< 1.2	< 0.37
40 South Ohio	Ambient Air	AA-1_AA_170906	9/6/2017	N	< 2.0	< 0.79	< 1.2	< 2.9	< 0.75
89 South Ohio	Ambient Air	AA-1_AA_170911	9/11/2017	N	< 2.0	< 0.79	< 1.2	< 2.9	< 0.75
660 Jackson	Ambient Air	AA-2_AA_170912	9/12/2017	N	< 1.9	< 0.76	< 1.1	< 2.8	< 0.72
39 South Ohio	Ambient Air	AA-1_AA_170926	9/26/2017	N	< 2.0	< 0.79	< 1.2	< 1.2	< 0.75
660 Jackson	Ambient Air	AA-01_AA_180305	3/6/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
60 South Ohio	Ambient Air	AA-02_AA_180305	3/6/2018	N	< 1.1	< 0.88	< 1.3	< 1.3	< 0.42
39 South Ohio	Ambient Air	AA-01_AA_180307	3/8/2018	N	< 0.97	< 0.77	< 1.1	< 1.1	< 0.37
40 South Ohio	Ambient Air	AA-01_AA_180308	3/9/2018	N	< 0.96	< 0.76	< 1.1	< 1.1	< 0.36
89 South Ohio	Ambient Air	AA-01_AA_180314	3/15/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39
759 East Washington	Ambient Air	AA-02_AA_180314	3/15/2018	N	1.4	< 0.77	< 1.1	< 1.1	< 0.37
89 South Ohio	Ambient Air	AA-01_AA_180314	3/15/2018	N	< 1.0	< 0.81	< 1.2	< 1.2	< 0.39

Notes:
N = Normal Field Sample
FD = Field Duplicate Sample
µg/m3 = micrograms per cubic meter
NE = Not Established
Screening levels obtained from IDEM's Remediation Closure Guide (RCG), March 22, 2012, updated 2018
Bold values exceed IDEM RCG Residential Indoor Air Screening Levels
Underlined values exceed IDEM RCG Residential Sub-Slab Screening Levels
Sub-Slab Screening Levels calculated by applying an attenuation factor of 0.03 per the October 2015 IDEM memorandum.
1M = The internal standard recovery associated with this result exceeds the lower control limit
A3 = The sample was analyzed by serial dilution.
E = Analyte concentration exceeded the calibration range. The reported result is estimated

Table 12. Remedial Alternatives Evaluation
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

General Response Action	Remedial Approach	Description	Protective of Human Health and the Environment?	Applicable and Appropriate?	Further Evaluation Warranted
No Action	No Response	No further action	No	No	No
	Monitored Natural Attenuation	Monitor to confirm natural degradation of contaminants is occurring and screen for potential changes in expoure potential.	Yes, in conjunction with other options	No	No
Institutional Controls	Environmental Restrictive Covenant	Deed restriction for Site and/or off-Site properties. May include restrictions on groundwater extraction, restrictions on property usage, and/or engineering control upkeep requirements.	Yes, in conjunction with other options	Yes	Yes
Engineering Controls	Structural Vapor Barrier	Construction of vapor barrier to mitigate vapor intrusion concerns in structures.	Yes	No	No
	Vapor Mitigation System	Installation and operation of vapor mitigation system to mitigate the vapor intrusion risk in structures.	Yes	Yes	Yes
	Residual Soil Contamination Isolation	Installation of an impermeable barrier to prevent further contaminant migration to groundwater from residual soil impacts.	Yes	Yes	Yes
	Evapotranspiration Cap	Installation of vegetative cover to mitigate further contaminant migration to groundwater by reducing precipitation infiltatration.	Yes	No	No
In-Situ Remediation	Air Sparge combined with Soil Vapor Extraction	Volatilization of contaminant mass and removal via vacuum extraction.	Yes	Yes	Yes
	Multi-Phase Extraction	Removal of contaminants in aqueous and liquid phases via vacuum extraction, combined with soil vapor extraction.	Yes	Yes	Yes
	Thermal Remediation	Removal of contaminants in aqueous, liquid, and sorbed phases by heating and volatilization, with subsequent vacuum extraction. Electrical resistance heating is considered under this option.	Yes	No	No
	Injection: In-Situ Chemical Oxidation	Injection of chemically reductive additives such as zero-valent iron to promote degradation of contaminants via reductive processes.	Yes	No	No
	Injection: In-Situ Chemical Reduction	Injection of chemically reductive additives to promote degradation of contaminants via reductive processes.	Yes	Yes	Yes
	Injection: Enhanced Reductive Dechlorination	Injection of an organic substrate to stimulate the growth of dehalogenating bacteria and, by extension, stimulate the degradation of chlorinated compounds via reductive dechlorination.	Yes	Yes	Yes
	Injection: Bioaugmentation	Injection of microorganisms to promote degredation of contaminants through direct or indirect biological processes.	Yes	Yes	Yes
	Injection: Permeable Reactive Barrier	Injection of materials designed to intercept and remediate a dissolved plume.	Yes	Yes	Yes
	Injection: Ozone Sparging	Combines air sparging with in-situ chemical oxidation. Ozone is added to air sparging injection stream to facilitate oxidative destruction of contaminants.	Yes	No	No
	Injection: Surfactant Enhanced Aquifer Remediation	Injection of surfactants into saturated media to promote the dissolution of non-aqueous phase liquid and subsequent recovery via an alternate remedial technology.	Yes	No	No
	Injection: Enhanced Aerobic Bioremediation	Application of nutrients and/or oxygen to the subsurface to accelerate naturally-occurring breakdown of contaminants via aerobic bacteria.	Yes	No	No
	Soil Mixing: In-Situ Chemical Oxidation	Involves the addition of oxidation reagents to a contaminated material (e.g. soil or sludge) to facilitate oxidative destruction of contaminants. Mixing of is performed using heavy equipment such as augers or specialized soil mixing tools.	Yes	No	No
	Soil Mixing: Solidification and Stabilization	Stabilization involves the addition of reagents to a contaminated material (e.g. soil or sludge) to produce more chemically stable constituents. Solidification involves the addition of reagents to a contaminated material to impart physical/dimensional stability to contain contaminants in a solid product and reduce access by external agents (e.g. air, rainfall). Mixing of soil is performed using heavy equipment such as augers or specialized soil mixing tools.	Yes	No	No
	Phytoremediation	Use of plants to remove, contain, and/or degrade contaminants.	Yes	No	No
Removal Action	Groundwater Extraction	Removal of contaminated groundwater via pumping and subsequent treatment.	Yes	Yes	Yes
	Excavation and Disposal	Removal of contaminated soil using excavation equipment.	Yes	Yes	Yes

Note:
Highlighted boxes indicate that this technology will move forward in the screening process

Table 13. ISCR Efficacy Evaluation
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

			Constituents of Concern							Field-Measured Geochemical Parameters						Laboratory-Reported Geochemical Parameters												
Well Location ID	**Date of Sample Collection**	**Time Elapsed Since Pilot Injections**	**Tetrachloroethene (µg/L)**	**Trichloroethene (µg/L)**	**cis-1,2-Dichloroethene (µg/L)**	**trans-1,2-Dichloroethene (µg/L)**	**Vinyl chloride (µg/L)**	**Total COCs**	**Overall Percent Reduction**	**pH (standard units)**	**Conductivity (mS/cm)**	**Dissolved Oxygen (mg/L)**	**Temperature (Celcius)**	**Oxidation Reduction Potential (mV)**	**Turbidity (NTUs)**	**Nitrate (mg/L)**	**Nitrite (mg/L)**	**Total Manganese (ug/L) (Manganese IV and soluble Manganese II)**	**Dissolved Manganese (ug/L) (Manganese II)**	**Total Iron (ug/L) (Ferric - Iron III & soluble Ferrous - Iron II)**	**Dissolved Iron (ug/L) (Ferrous - Iron II)**	**Sulfate (mg/L)**	**Methane (ug/L)**	**Ethane (ug/L)**	**Ethene (ug/L)**	**Alkalinity (mg/L)**	**Chemical Oxygen Demand (mg/L)**	**Biological Oxygen Demand (mg/L)**
MW-01	07/31/2018	Baseline	67.8	< 5.0	9.0	< 5.0	< 2.0	88.8	--	6.99	1.220	4.75	19.16	154	12.7	7.5	7.6	13.5	< 5.0	< 100.0	< 70.0	23.1	< 10.0	< 10.0	< 10.0	271	< 10.0	< 6.0
	08/28/2018	30 Days	84.6	< 5.0	< 5.0	< 5.0	< 2.0	102	-14.41%	7.39	0.870	3.67	28.57	102	137	7.6	< 0.50	287	< 10.0	551	< 100	23.0	< 10.0	< 10.0	< 10.0	280	< 10.0	< 12.0
	11/27/2018	120 Days	78.2	< 5.0	< 5.0	< 5.0	< 2.0	95.2	-7.21%	7.08	0.903	4.95	15.30	109	16.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/21/2019	205 Days	51.6	< 5.0	< 5.0	< 5.0	< 2.0	68.6	22.75%	7.26	0.98	5.31	12.76	107.7	30.70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/22/2019	295 Days	13.0	< 5.0	< 5.0	< 5.0	< 2.0	30.0	66.22%	7.06	1.18	6.61	18.10	112.5	95.62	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-04	07/30/2018	Baseline	291	< 5.0	< 5.0	< 5.0	< 2.0	308	--	7.06	0.927	6.21	17.11	132	650	7.9	< 0.20	61.0	< 5.0	1,740	< 70.0	19.9	< 10.0	< 10.0	< 10.0	280	< 10.0	< 2.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	92.86%	7.47	1.080	0.00	28.68	12	108	4.6	0.37	1,780	1,680	6,800	< 100	30.8	11.6	< 10.0	< 10.0	297	66.0	< 12.0
	11/28/2018	121 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	92.86%	6.90	1.030	6.61	15.13	161	93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/21/2019	205 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	92.86%	6.83	0.94	5.54	11.46	171.6	45.93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	7.0	< 5.0	< 5.0	< 5.0	< 2.0	24.0	92.21%	7.13	1.06	4.83	19.04	213.3	190.65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-05	07/30/2018	Baseline	82.4	< 5.0	< 5.0	< 5.0	< 2.0	99.4	--	6.97	0.808	0.71	15.72	130	16.5	1.6	< 0.10	13.8	< 5.0	480	< 70.0	18.5	< 10.0	< 10.0	< 10.0	350	< 10.0	2.0
	08/29/2018	30 Days	10.6	< 5.0	< 5.0	< 5.0	< 2.0	27.6	72.23%	7.21	0.696	2.74	27.29	-17	181	0.45	< 0.10	418	197	3,620	< 100	24.2	< 10.0	< 10.0	< 10.0	391	20.7	< 12.0
	11/28/2018	121 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	77.87%	6.93	0.907	0.27	14.15	153	376	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/21/2019	205 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	77.87%	6.68	0.88	0.53	14.21	139.5	18.53	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	77.87%	7.00	0.78	0.57	23.83	177.1	305.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-08	07/30/2018	Baseline	15.2	< 5.0	< 5.0	< 5.0	< 2.0	32.2	--	6.98	1.220	7.64	18.84	119	9.2	11.4	< 1.0	53.0	< 5.0	1,260	< 70.0	37.3	< 10.0	< 10.0	< 10.0	283	< 10.0	< 2.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	31.68%	7.27	1.110	0.00	7.27	-77	303	1.7	0.40	2,430	1,930	20,700	< 100	37.1	34.1	< 10.0	< 10.0	520	75.7	< 12.0
	11/27/2018	120 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	31.68%	7.07	0.942	1.59	16.25	95	13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/21/2019	205 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	31.68%	6.88	1.70	4.71	14.45	103.9	60.87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/22/2019	295 Days	6.6	< 5.0	< 5.0	< 5.0	< 2.0	23.6	26.71%	7.07	1.04	6.60	18.05	72.8	33.93	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	07/31/2018	Baseline	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	--	6.87	1.080	7.44	21.29	147	9.5	13.5	13.5	122	< 5.0	1,980	< 70.0	56.2	< 10.0	< 10.0	< 10.0	286	< 10.0	< 2.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	7.16	0.970	4.55	25.46	106	0.0	11.7	< 1.0	79.4	< 10.0	994	< 100	73.3	< 10.0	< 10.0	< 10.0	313	< 10.0	< 3.0
	11/26/2018	119 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	6.79	1.020	6.37	17.54	109	14.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/20/2019	204 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	7.28	0.22	9.76	7.77	72.0	334.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/21/2019	294 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	6.93	1.15	7.51	13.90	163.2	95.90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 13. ISCR Efficacy Evaluation
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Well Location ID	Date of Sample Collection	Time Elapsed Since Pilot Injections	Constituents of Concern						Overall Percent Reduction	Field-Measured Geochemical Parameters						Laboratory-Reported Geochemical Parameters												
			Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Total COCs		pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celcius)	Oxidation Reduction Potential (mV)	Turbidity (NTUs)	Nitrate (mg/L)	Nitrite (mg/L)	Total Manganese (ug/L) (Manganese IV and soluble Manganese II)	Dissolved Manganese (ug/L) (Manganese II)	Total Iron (ug/L) (Ferric - Iron III & soluble Ferrous - Iron II)	Dissolved Iron (ug/L) (Ferrous - Iron II)	Sulfate (mg/L)	Methane (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Alkalinity (mg/L)	Chemical Oxygen Demand (mg/L)	Biological Oxygen Demand (mg/L)
MW-15D	07/30/2018	Baseline	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	--	6.92	0.820	0.05	17.73	142	>1,000	2.0	< 0.10	148	51.7	3,310	< 70.0	20.2	< 10.0	< 10.0	< 10.0	390	< 10.0	< 6.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	7.22	0.762	0.00	18.89	117	57.6	1.0	0.99	18.5	< 10.0	631	< 100	25.6	10.1	< 10.0	12.6	333	< 10.0	< 2.0
	11/28/2018	121 Days	9.5	< 5.0	< 5.0	< 5.0	< 2.0	26.5	-20.45%	6.87	0.859	0.32	13.45	134	118.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/22/2019	206 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	6.56	0.94	3.46	13.31	131.6	218.40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	6.96	0.84	0.63	21.75	155	39.38	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	07/30/2018	Baseline	165	< 5.0	< 5.0	< 5.0	< 2.0	182	--	7.01	0.765	5.97	20.06	11	272	7.6	< 0.20	90.6	21.9	1,200	< 70.0	18.2	< 10.0	< 10.0	< 10.0	288	< 10.0	< 2.0
	08/30/2018	30 Days	128	< 5.0	< 5.0	< 5.0	< 2.0	145	20.33%	7.29	0.778	4.42	22.88	159	18.2	9.4	9.4	166	< 10.0	4,180	< 100	18.8	< 10.0	< 10.0	< 10.0	308	< 10.0	< 2.0
	11/28/2018	121 Days	147	< 5.0	< 5.0	< 5.0	< 2.0	164	9.89%	6.91	0.919	5.53	11.62	176	272.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/22/2019	206 Days	87	< 5.0	< 5.0	< 5.0	< 2.0	104	43.08%	6.65	0.9	5.87	12.11	135.9	68.76	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	156	< 5.0	< 5.0	< 5.0	< 2.0	173	4.95%	6.77	0.82	5.9	23.88	196.2	121.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-16	07/31/2018	Baseline	18.8	< 5.0	< 5.0	< 5.0	< 2.0	35.8	--	7.00	0.879	6.24	19.19	124	220	2.7	2.7	39.0	< 5.0	603	< 70.0	12.3	< 10.0	< 10.0	< 10.0	322	< 10.0	< 2.0
	08/29/2018	30 Days	20.3	< 5.0	< 5.0	< 5.0	< 2.0	37.3	-4.19%	6.73	0.781	4.36	18.97	155	36.4	2.4	< 0.10	136	< 10.0	1,120	< 100	13.9	< 10.0	< 10.0	< 10.0	378	< 10.0	< 12.0
	11/27/2018	120 Days	30.5	< 5.0	< 5.0	< 5.0	< 2.0	47.5	-32.68%	7.09	0.730	5.37	15.35	104	14.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/21/2019	205 Days	14.8	< 5.0	< 5.0	< 5.0	< 2.0	31.8	11.17%	6.91	0.85	6.61	13.65	76.9	415.63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	7.8	< 5.0	< 5.0	< 5.0	< 2.0	24.8	30.73%	7.03	0.85	6.99	21.77	186	109.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-17	07/30/2018	Baseline	16.7	< 5.0	< 5.0	< 5.0	< 2.0	33.7	--	6.90	0.885	7.56	19.89	196	164	2.8	< 0.10	489	< 5.0	11,900	< 70.0	23.0	< 10.0	< 10.0	< 10.0	408	< 10.0	< 6.0
	08/28/2018	30 Days	26.3	< 5.0	< 5.0	< 5.0	< 2.0	43.3	-28.49%	7.20	0.763	5.31	21.55	112	5.1	6.9	< 0.50	35.2	< 10.0	351	< 100	25.8	< 10.0	< 10.0	< 10.0	312	< 10.0	< 12.0
	11/28/2018	121 Days	22.7	< 5.0	< 5.0	< 5.0	< 2.0	39.7	-17.80%	6.90	0.822	6.86	15.05	236	34.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/21/2019	205 Days	17.4	< 5.0	< 5.0	< 5.0	< 2.0	34.4	-2.08%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/22/2019	295 Days	12.7	< 5.0	< 5.0	< 5.0	< 2.0	29.7	11.87%	7.04	1.09	6.61	16.71	178.7	16.88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-19	07/30/2018	Baseline	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	--	6.93	1.050	4.48	19.38	155	>1,000	3.4	< 0.10	910	< 5.0	10,900	< 70.0	19.7	< 10.0	< 10.0	< 10.0	383	< 10.0	< 2.0
	08/29/2018	30 Days	67.8	< 5.0	< 5.0	< 5.0	< 2.0	84.8	-285.45%	7.24	0.846	6.33	21.72	149	11.4	7.3	< 0.20	195	< 10.0	791	< 100	52.1	< 10.0	< 10.0	< 10.0	343	< 10.0	< 12.0
	11/28/2018	121 Days	69.4	< 5.0	< 5.0	< 5.0	< 2.0	86.4	-292.73%	7.08	0.899	6.59	15.72	116	49.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/22/2019	206 Days	51.1	< 5.0	< 5.0	< 5.0	< 2.0	68.1	-209.55%	7.07	0.94	6.60	11.39	132.2	26.18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	21.2	< 5.0	< 5.0	< 5.0	< 2.0	38.2	-73.64%	6.85	1.55	6.65	22.46	194.8	182.96	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 13. ISCR Efficacy Evaluation
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Well Location ID	Date of Sample Collection	Time Elapsed Since Pilot Injections	Constituents of Concern						Overall Percent Reduction	Field-Measured Geochemical Parameters						Laboratory-Reported Geochemical Parameters												
			Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Total COCs		pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celcius)	Oxidation Reduction Potential (mV)	Turbidity (NTUs)	Nitrate (mg/L)	Nitrite (mg/L)	Total Manganese (ug/L) (Manganese IV and soluble Manganese II)	Dissolved Manganese (ug/L) (Manganese II)	Total Iron (ug/L) (Ferric - Iron III & soluble Ferrous - Iron II)	Dissolved Iron (ug/L) (Ferrous - Iron II)	Sulfate (mg/L)	Methane (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Alkalinity (mg/L)	Chemical Oxygen Demand (mg/L)	Biological Oxygen Demand (mg/L)
MW-24	07/30/2018	Baseline	79.8	< 5.0	< 5.0	< 5.0	< 2.0	96.8	--	6.95	0.941	5.85	18.50	139	17.0	6.7	< 0.20	170	< 5.0	1,750	< 70.0	95.4	< 10.0	< 10.0	< 10.0	356	< 10.0	< 2.0
	08/30/2018	30 Days	108	< 5.0	< 5.0	< 5.0	< 2.0	125	-29.13%	6.79	0.940	6.77	21.52	177	119	9.5	9.5	1,120	< 10.0	21,200	< 100	27.9	< 10.0	< 10.0	< 10.0	360	76.7	< 2.0
	11/28/2018	121 Days	157	< 5.0	< 5.0	< 5.0	< 2.0	174	-79.75%	7.00	1.030	5.50	16.35	120	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/22/2019	206 Days	111	< 5.0	< 5.0	< 5.0	< 2.0	128	-32.23%	7.12	0.88	5.47	13.08	117.8	13.82	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	57.1	< 5.0	< 5.0	< 5.0	< 2.0	74.1	23.45%	6.97	1.29	6.07	21.73	179.2	102.04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-26	07/31/2018	Baseline	124	< 5.0	< 5.0	< 5.0	< 2.0	141	--	6.89	0.835	3.65	20.37	21	143	5.9	5.9	88.1	57.5	625	< 70.0	13.3	< 10.0	< 10.0	< 10.0	273	< 10.0	< 2.0
	08/29/2018	30 Days	154	< 5.0	< 5.0	< 5.0	< 2.0	171	-21.28%	7.03	0.861	2.25	21.61	135	48.2	9.2	< 1.0	423	354	45,000	< 100	15.8	< 10.0	< 10.0	< 10.0	312	46.8	< 20.0
	11/28/2018	121 Days	163	< 5.0	< 5.0	< 5.0	< 2.0	180	-27.66%	7.10	0.879	5.84	16.57	114	161.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	02/22/2019	206 Days	61	< 5.0	< 5.0	< 5.0	< 2.0	78.0	44.68%	7.07	1.06	6.99	9.97	129.5	34.99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	05/23/2019	296 Days	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Pilot injections completed July 30 through August 3, 2018.

Percent reduction calculated based on total mass of the COCs.

NA = Not Analyzed

< = Analyte not detected at the specified detection level

Table 14 - Groundwater Monitoring Schedule
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

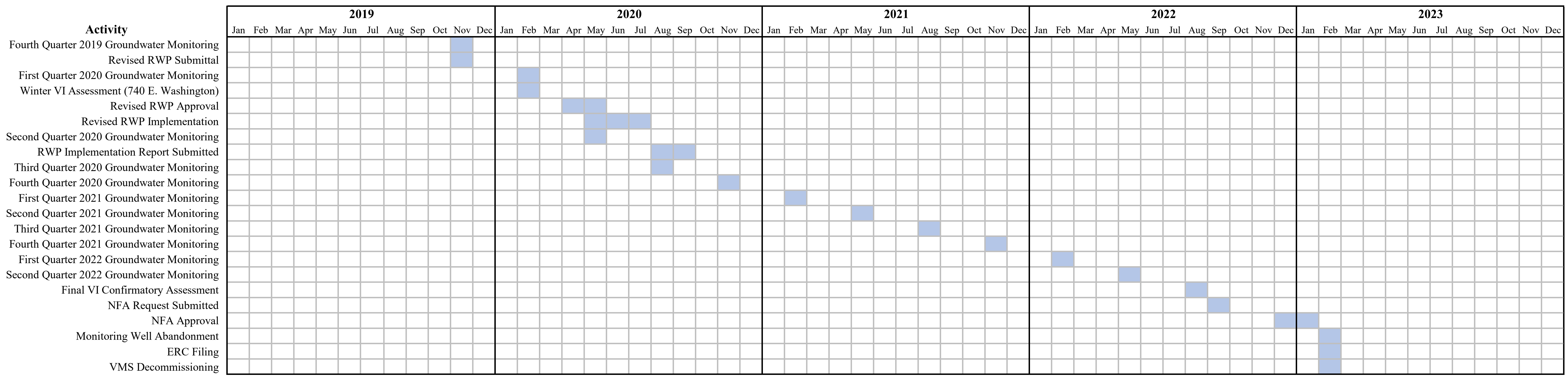
Well ID	Zone	1st Sample	Total Samples	Representative Concentrations (µg/L) PCE 5	TCE 5	DCE 70	VC 2	2020-2021 Q1	Q2	Q3	Q4
MW-1	6'-16'	1/23/15	15	36.8	ND	ND	ND	X	X	X	X
MW-2	6'-16'	1/23/15	14	ND	ND	ND	ND	X	X	X	X
MW-3	6'-16'	1/23/15	14	ND	ND	ND	ND	X	X	X	X
MW-4	6'-16'	4/6/15	14	15.3	ND	ND	ND	X	X	X	X
MW-5	6'-16'	4/6/15	14	ND	ND	ND	ND	X	X	X	X
MW-6	6'-16'	4/6/15	14	90.1	ND	ND	ND	X	X	X	X
MW-7	6'-16'	9/28/15	13	7.6	ND	ND	ND	X	X	X	X
MW-8	6'-16'	9/28/15	14	62.6	ND	12	ND	X	X	X	X
MW-9	6'-16'	9/28/15	14	189.8	ND	ND	ND	X	X	X	X
MW-9D	32.5'-37.5'	9/20/17	9	43.2	ND	ND	ND	X	X	X	X
MW-10	6'-16'	9/28/15	14	15.5	ND	ND	ND	X	X	X	X
MW-11	6'-16'	2/4/16	14	ND	ND	ND	ND	X	X	X	X
MW-12	6'-16'	2/4/16	13	8.3	ND	ND	ND	X	X	X	X
MW-13	6'-16'	2/4/16	13	17.5	ND	ND	ND	X	X	X	X
MW-14	6'-16'	2/5/16	13	11.1	ND	ND	ND	X	X	X	X
MW-15	6'-16'	2/5/16	14	161.6	ND	ND	ND	X	X	X	X
MW-15D	30'-35'	9/20/17	9	5.5	ND	ND	ND	X	X	X	X
MW-16	6'-16'	2/4/16	16	17.2	ND	ND	ND	X	X	X	X
MW-17	6'-16'	2/5/16	14	20.2	ND	ND	ND	X	X	X	X
MW-18	10'-20'	2/5/16	13	21.2	ND	ND	ND	X	X	X	X
MW-19	10'-20'	2/5/16	14	70.4	ND	ND	ND	X	X	X	X
MW-20	10'-20'	2/4/16	13	17.2	ND	ND	ND	X	X	X	X
MW-21	10'-20'	2/4/16	13	ND	ND	ND	ND	X	X	X	X
MW-22	10'-20'	9/13/16	12	104.8	ND	ND	ND	X	X	X	X
MW-23	10'-20'	9/13/16	12	ND	ND	ND	ND	X	X	X	X
MW-24	10'-20'	9/13/16	12	129	ND	ND	ND	X	X	X	X
MW-25	10'-20'	9/13/16	12	ND	ND	ND	ND	X	X	X	X
MW-26	7'-17'	9/13/16	9	136.1	ND	ND	ND	X	X	X	X
MW-27	10'-20'	9/19/17	8	ND	ND	ND	ND	X	X	X	X
MW-28	10'-20'	9/19/17	8	12.7	ND	ND	ND	X	X	X	X
MW-29	10'-20'	9/19/17	8	11.3	ND	ND	ND	X	X	X	X
NPL-MW-04B	89'-99'	--	--	--	--	--	--	G	G	G	G
NPL-MW-04M	50'-60'	--	--	--	--	--	--	G	G	G	G
NPL-MW-04S	8'-18'	--	--	--	--	--	--	G	G	G	G
NPL-MW-28S	11'-21'	--	--	--	--	--	--	G	G	G	G
NPL-MW-29S	13'-23'	--	--	--	--	--	--	G	G	G	G
NPL-MW-32S	10.5'-20.5'	--	--	--	--	--	--	G	G	G	G
NPL-MW-34S	13'-23'	--	--	--	--	--	--	G	G	G	G
NPL-MW-35S	11'-21'	--	--	--	--	--	--	G	G	G	G
NPL-MW-36S	13'-23'	--	--	--	--	--	--	G	G	G	G

	Q1	Q2	Q3	Q4
Sampled	31	31	31	31
Gauge Only	9	9	9	9

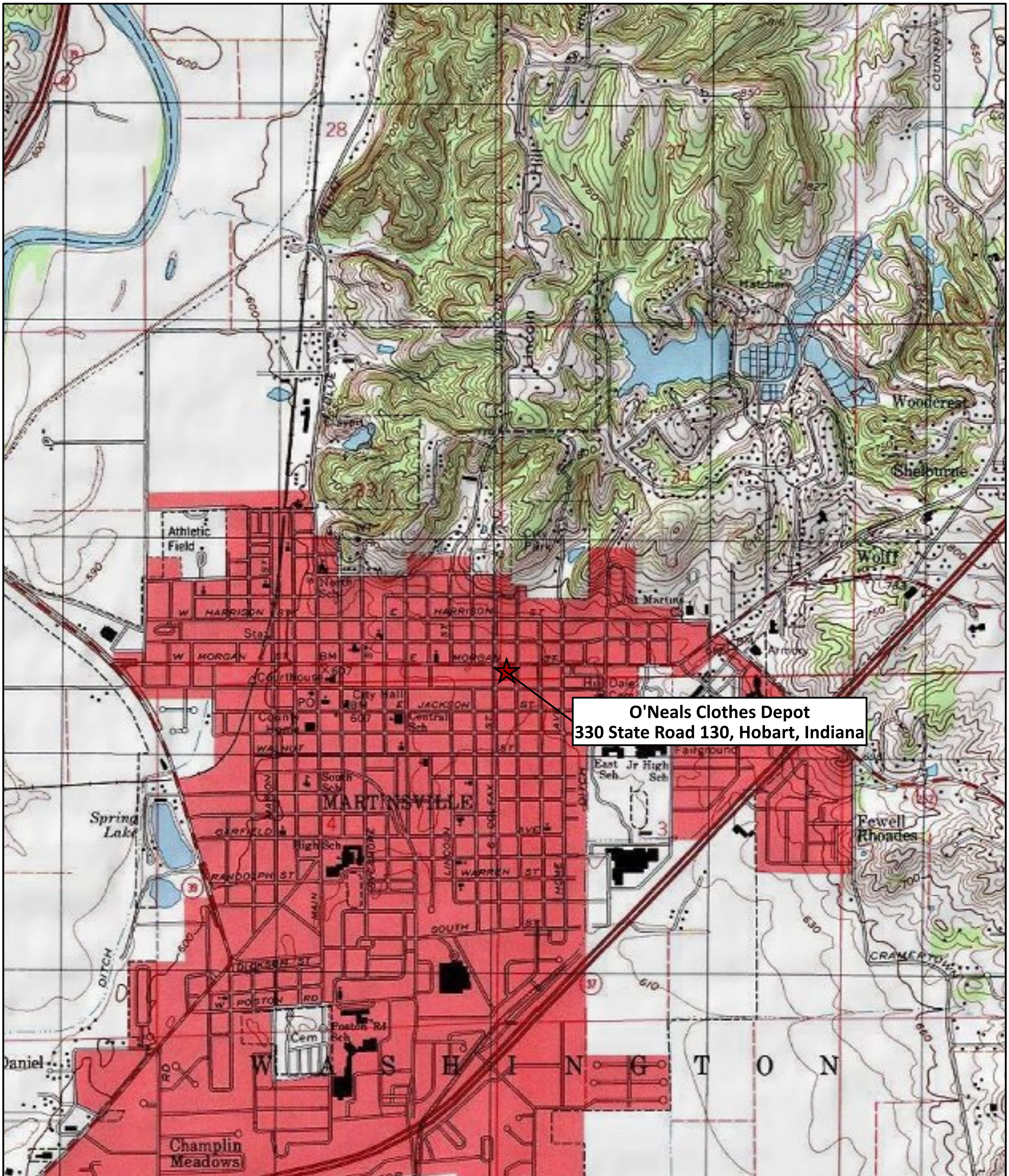
Below RCG Residential Screening Level
Exceeds RCG Residential Screening level
>10X RCG Residential Screening level
>100X RCG Residential Screening Level

[1]Representative concentrations are averaged using all sampling events to date.

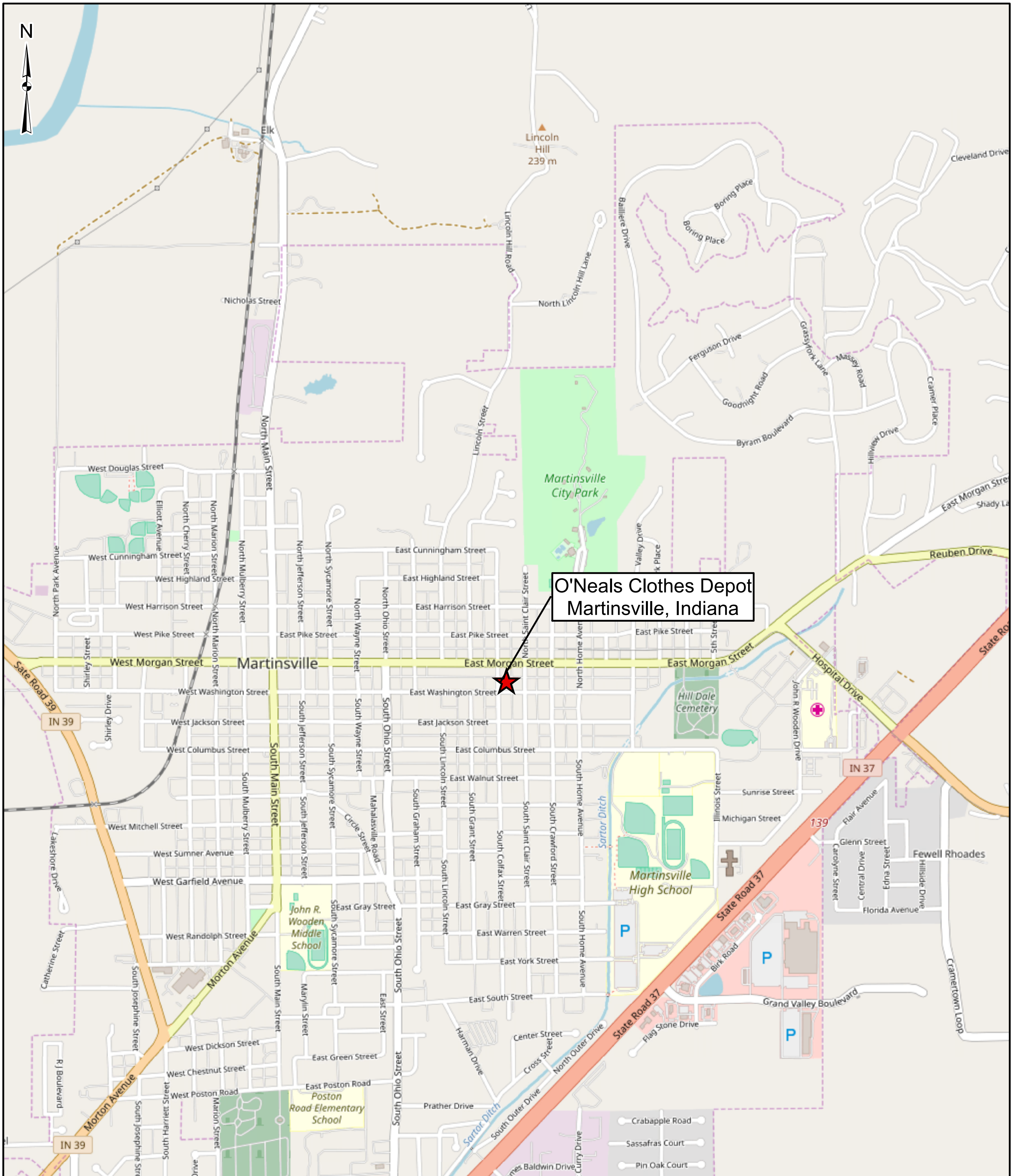
Table 15. Project Schedule
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402



FIGURES



WILCOX ENVIRONMENTAL ENGINEERING	**Figure 1 - Site Vicinity Map** Former O'Neals Clothes Depot 833 E. Morgan St. Martinsville, Indiana	Project #: 341.14 Project Manager: Jeremy Kinman File #: 341.14-001 Drawn By: KC — Checked By: JK	**Data Sources:** *Topographic Basemap: Published by USGS from National Geographic Society, 2013* 0 0.15 0.3 0.45 0.6 0.75 Miles — N



WILCOX
ENVIRONMENTAL ENGINEERING

Figure 2 - Regional Location Map

Former O'Neals Clothes Depot
833 E. Morgan St.
Martinsville, Indiana

Project #: 341.14	
Project Manager: Kinman	
File #: 341.14-002	
Drawn By: KC	Checked By: JK

Data Sources:
© OpenStreetMap contributors

0 0.1 0.2 0.3 0.4 0.5
Miles

SCALE 1" = 80'

DATE 10/29/19

FIGURE NO. 3

WILCOX PROJECT # 341.14

PROJECT MANAGER J. KINMAN

FILE NO. 34114001

SITE PLAN

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX ENVIRONMENTAL ENGINEERING

Primary Source	Exposure Pathways		Exposure Route	On-Site Receptors: Commercial /Industrial	Excavation	Residential	Recreational	Off-Site Receptors: Commercial/ Industrial	Excavation	Residential	Recreational
Dry Cleaning Operations	Soil	Direct Contact	Dermal	X	X	-	-	-	-	X	-
			Inhalation (particles)	X	X	-	-	-	-	X	-
			Ingestion	X	X	-	-	-	-	X	-
	Migration to Groundwater	Vapor	Inhalation (vapor)	-	-	-	-	-	-	+	-
	Groundwater		Ingestion (tap)	+	+	-	-	+	+	+	-
	Surface water		Dermal	-	-	-	-	-	-	-	-
			Ingestion	-	-	-	-	-	-	-	-
	Sediment		Dermal	-	-	-	-	-	-	-	-
			Ingestion	-	-	-	-	-	-	-	-

Assumptions and Notes

The site operated as a dry cleaning facility from 1987 to 1996 and 1997 to 2011 and is currently operated as a drop off facility.

Surrounding properties include residential and commercial and are supplied with municipal water.

The site is located within a wellhead protection area.

The CSM assumes surrounding property use will remain the same.

Pathway Key

+	Pathway is complete or potentially complete
X	Pathway incomplete
-	Pathway is not applicable

Remediation Key

(yellow)	Further Evaluation
(blue)	Engineering and/or Institutional Controls
(green)	No Remediation Necessary

SCALE --- | DATE 12/6/2018 | FIGURE 4

WILCOX PROJECT # 341.14 | PROJECT MANAGER J. Kinman | FILE NUMBER

CONCEPTUAL SITE MODEL

REMEDIATION WORK PLAN
ONEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

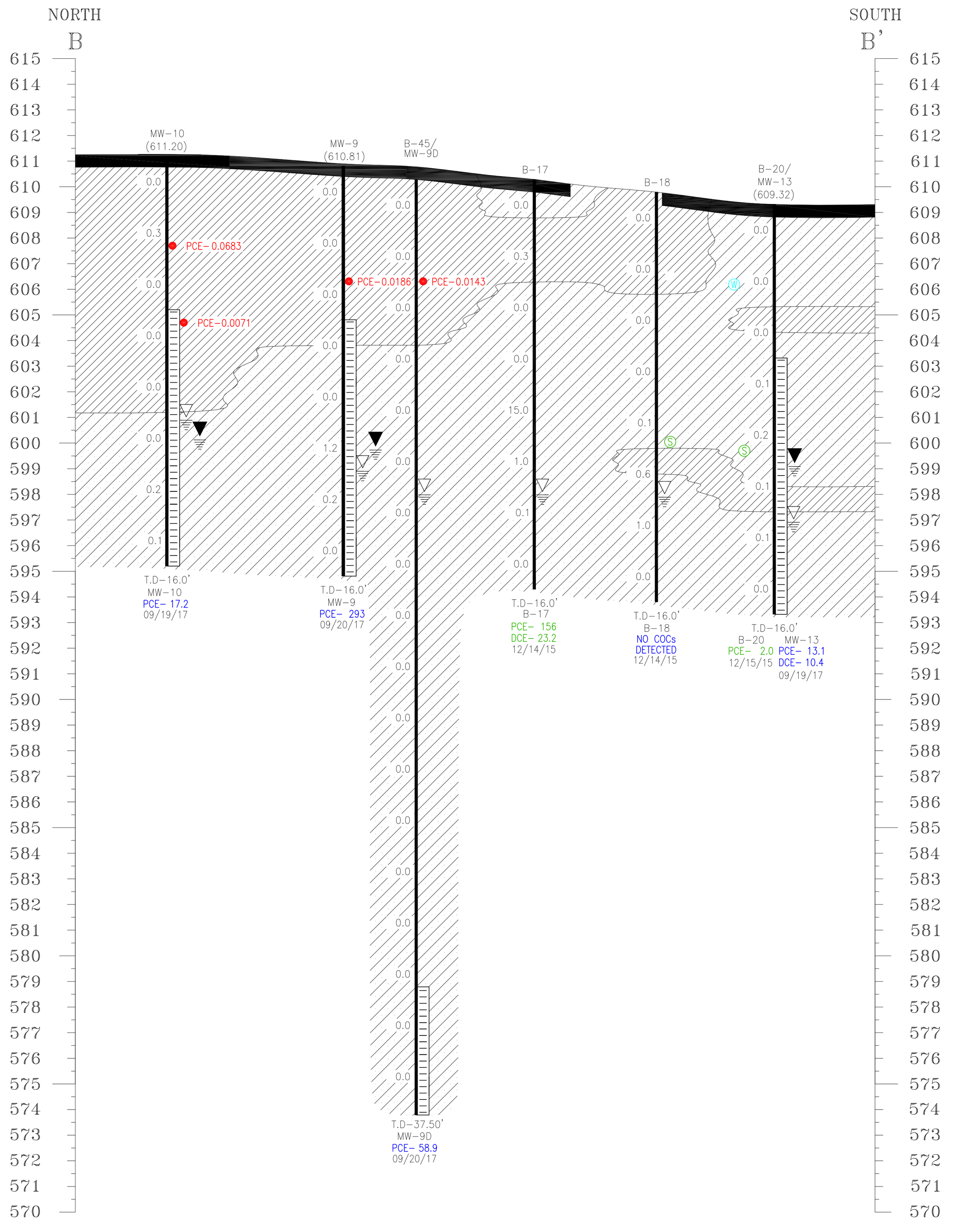
WILCOX ENVIRONMENTAL ENGINEERING

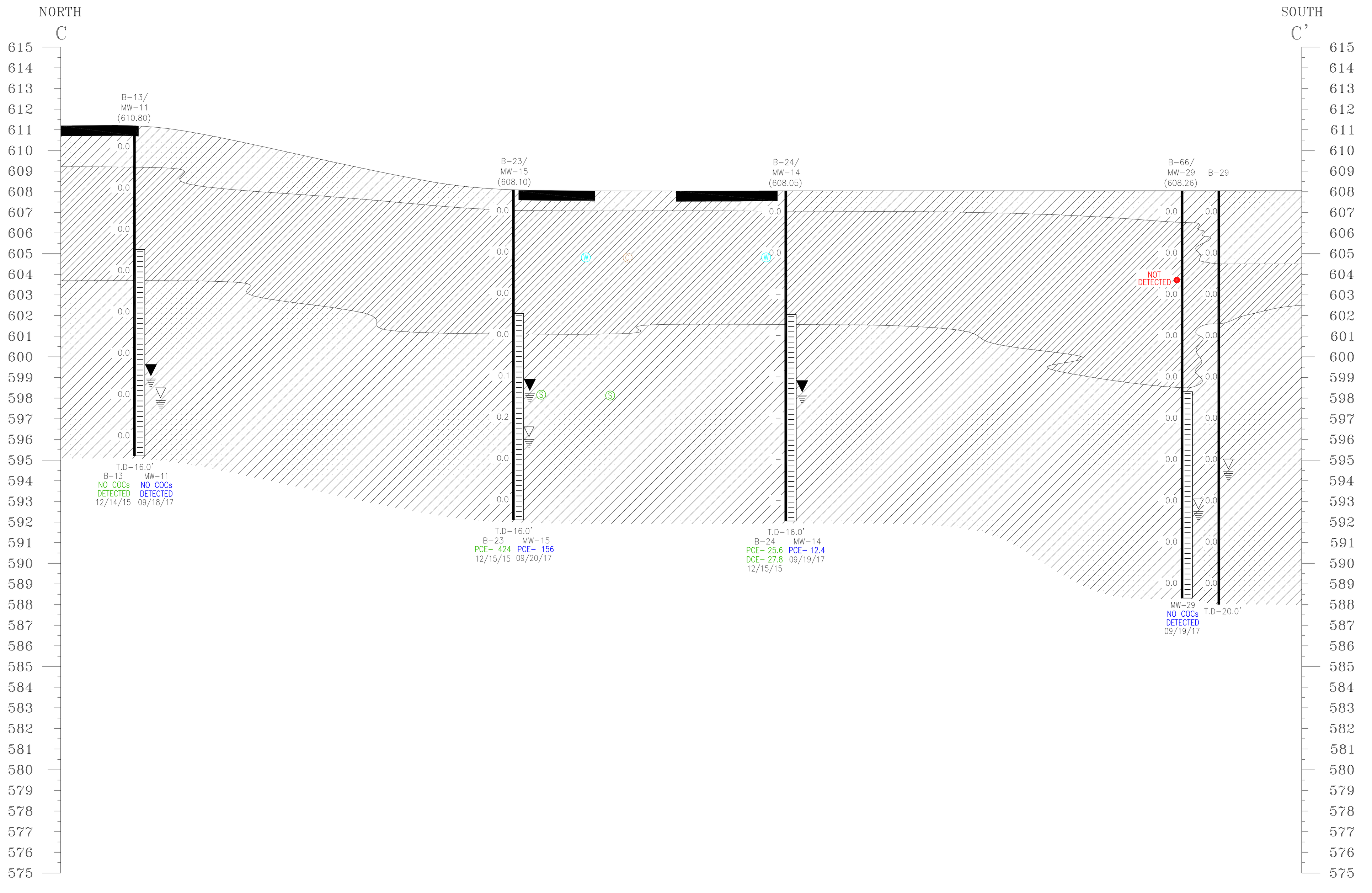
SCALE 1" = 80'	WILCOX PROJECT # 341.14
DATE 10/29/19	PROJECT MANAGER J. KINMAN
FIGURE NO. 5	FILE NO. 34114003

VAPOR INTRUSION ASSESSMENT

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING





LEGEND

ANALYTICAL TEST PARAMETERS

PCE- TETRACHLOROETHENE CONCENTRATION
TCE- TRICHLOROETHENE CONCENTRATION
DCE- cis-1,2-DICHLOROETHENE CONCENTRATION
tDCE- trans-1,2-DICHLOROETHENE CONCENTRATION

ONLY DETECTED CHEMICALS OF CONCERN (COCs) ARE SHOWN.

GROUNDWATER ANALYSES REPORTED IN MICROGRAMS PER LITER (µg/L).
GROUNDWATER ANALYTICAL RESULTS ARE SHOWN IN BLUE.
GROUNDWATER ANALYTICAL RESULTS ANALYZED BY THE FROG 4000 ARE SHOWN IN GREEN.

SOIL ANALYSES REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
SOIL ANALYTICAL RESULTS ARE SHOWN IN RED.

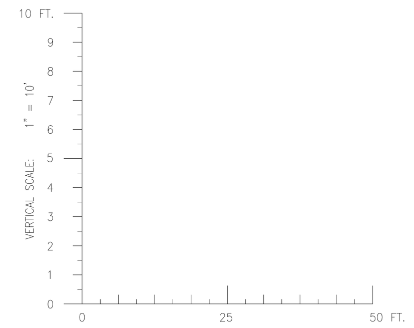
G GAS LINE
S SANITARY SEWER LINE
C COMMUNICATION LINE
W WATER LINE

ACTUAL DEPTH OF UTILITY UNKNOWN, SHOWN AT 3' BGS.

VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'

ASPHALT
SAND, CLAYEY SAND
CLAY
SILT
N/R NO RECOVERY

B-43/ MW-21 (604.80) BORING/MONITORING WELL I.D.
TOP OF CASING ELEVATION
0.0 PID READING
SOIL SAMPLE DEPTH
WATER LEVEL NOTED IN BORING DURING DRILLING OPERATIONS
STATIC WATER LEVEL (09/18/17)
MONITORING WELL SCREEN INTERVAL
T.D. 20.0' TOTAL DEPTH OF BORING



HORIZONTAL SCALE: 1" = 50'

WILCOX ENVIRONMENTAL ENGINEERING

GENERALIZED HYDROGEOLOGICAL CROSS-SECTIONS

O'NEALS CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

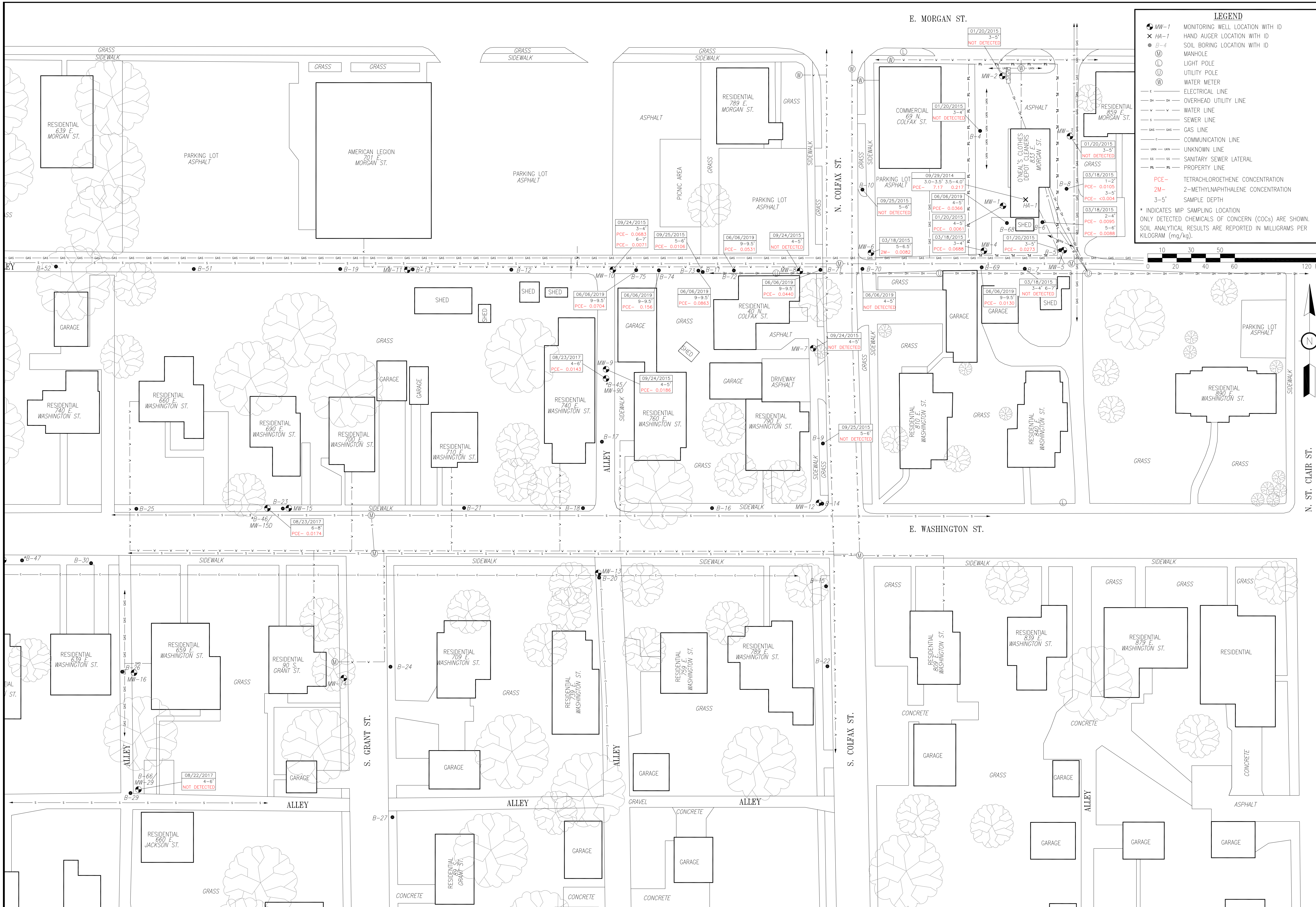
WILCOX PROJECT # 341.14	SCALE SEE LEGEND
PROJECT MANAGER J. KINMAN	DATE 10/04/17
FILE NO. 34114005	FIGURE NO. 6

POTENTIOMETRIC SURFACE (5/20/19)

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT # 341.14	SCALE 1" = 80'
PROJECT MANAGER J. KINMAN	DATE 10/29/19
FILE NO. 34114006	FIGURE NO. 7

WILCOX ENVIRONMENTAL ENGINEERING


LEGEND
MW-1 MONITORING WELL LOCATION WITH ID
HA-1 HAND AUGER LOCATION WITH ID
B-4 SOIL BORING LOCATION WITH ID
MANHOLE
LIGHT POLE
UTILITY POLE
WATER METER
ELECTRICAL LINE
OVERHEAD UTILITY LINE
WATER LINE
SEWER LINE
GAS LINE
COMMUNICATION LINE
UNKNOWN LINE
SANITARY SEWER LATERAL
PROPERTY LINE
PCE- TETRACHLOROETHENE CONCENTRATION
2M- 2-METHYLNAPHTHALENE CONCENTRATION
3-5' SAMPLE DEPTH
* INDICATES MIP SAMPLING LOCATION
ONLY DETECTED CHEMICALS OF CONCERN (COCs) ARE SHOWN.
SOIL ANALYTICAL RESULTS ARE REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
0 20 40 60 120 FT.
E. MORGAN ST.
E. WASHINGTON ST.
N. COLFAX ST.
S. COLFAX ST.
S. GRANT ST.
N. ST. CLAIR ST.
ALLEY
O'NEAL'S CLOTHES DEPOT CLEANERS 833 E. MORGAN ST.
COMMERCIAL 69 N. COLFAX ST.
AMERICAN LEGION 701 E. MORGAN ST.
RESIDENTIAL 639 E. MORGAN ST.
RESIDENTIAL 789 E. MORGAN ST.
RESIDENTIAL 859 E. MORGAN ST.
PARKING LOT ASPHALT
PICNIC AREA

CUMULATIVE SOIL ANALYTICAL RESULTS
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN
SCALE 1" = 60'
DATE 10/25/19
FIGURE NUMBER 8
WILCOX PROJECT # 341.14
PROJECT MANAGER J. KINMAN
FILE NUMBER 34114009
WILCOX ENVIRONMENTAL ENGINEERING

SCALE
1" = 80'

DATE
10/29/19

FIGURE NO.
9

WILCOX PROJECT #
341.14

PROJECT MANAGER
J. KINMAN

FILE NO.
34114003

GROUNDWATER ANALYTICAL RESULTS

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING

WILCOX PROJECT #
341.14
PROJECT MANAGER
J. KINMAN
FILE NO.
34114004
SCALE
1" = 80'
DATE
10/29/19
FIGURE NO.
10

TETRACHLOROETHENE ISOCONCENTRATION - SHALLOW WELL LOCATIONS

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING

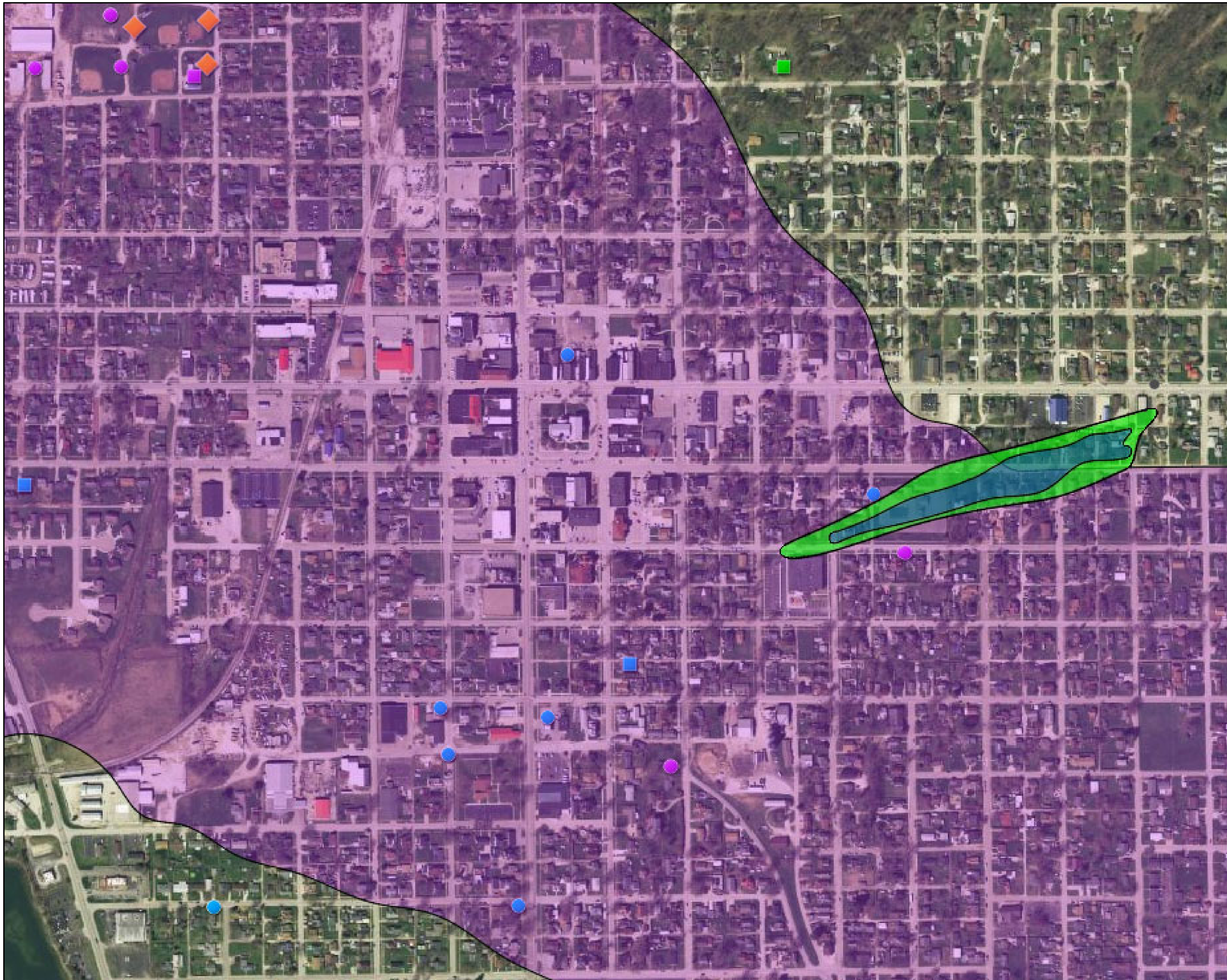


Figure 11-

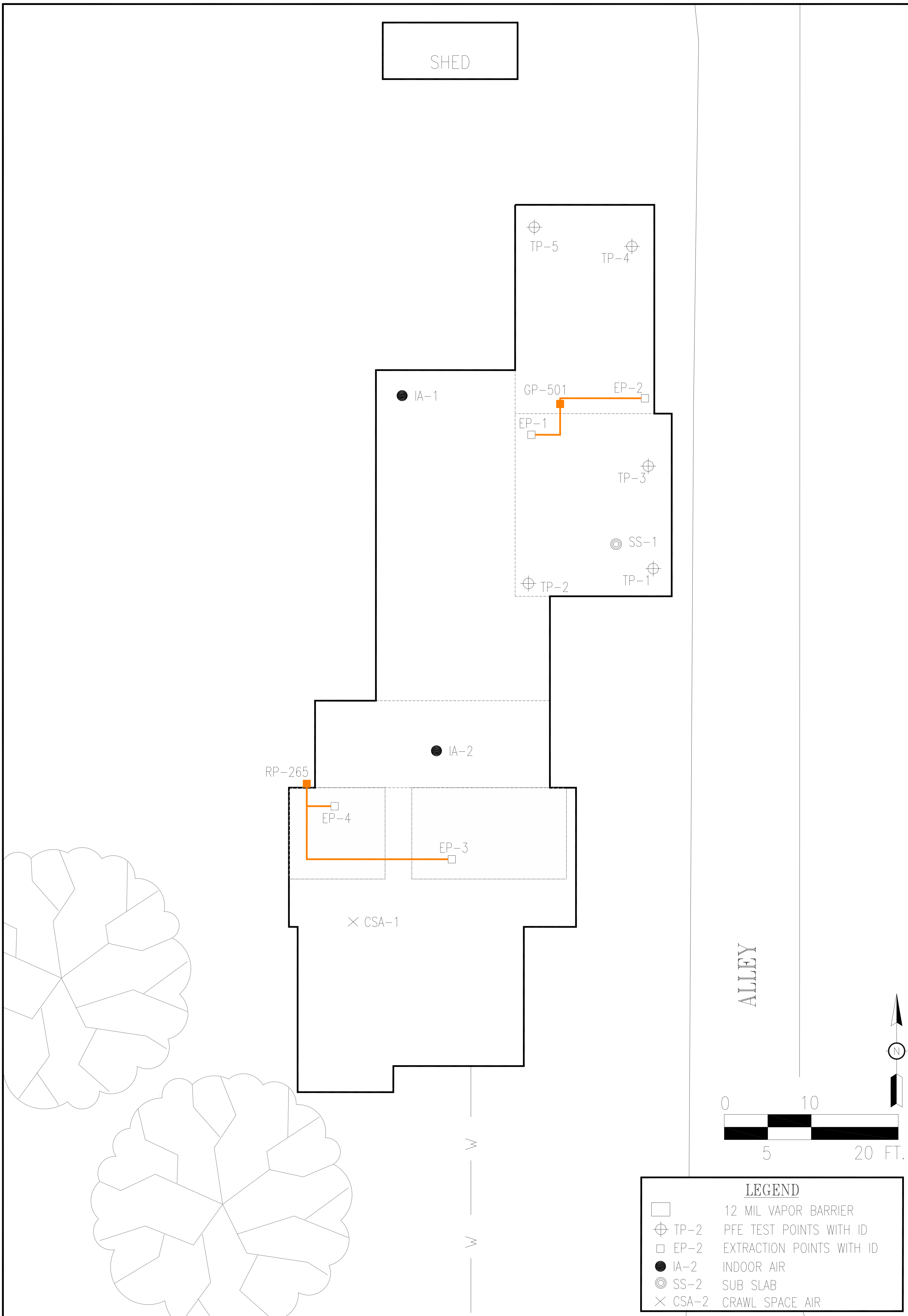
Former O'Neal's Clothes Depot
833 East Morgan Street
Martinsville, IN 46151

Project #: 341.14	PM: Kinman
Date: 04/03/2017	File #: 341140011
Drawn By: KC	Checked By: JK

Data Sources:
Basemap: OpenStreetMap

Boreholes drilled to bedrock
Boreholes drilled to bedrock (Field Located)
Unconsolidated wells
Unconsolidated wells (Field Located)
Unspecified well type
Unspecified well type (Field Located)
Significant withdraw wells
Approximate Wellhead Protection Area
RGWSL PCE
RVIGWSL PCE

1 inch = 83,333.33 feet



WILCOX ENVIRONMENTAL ENGINEERING

VMS LAYOUT
740 EAST WASHINGTON STREET

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT # 341.14	SCALE 1" = 10'
PROJECT MANAGER J. KINMAN	DATE 09/11/18
FILE NO. 34114002A	FIGURE NO. 12

ISCR PILOT STUDY DETAIL MAP

O'NEALS CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT # 341.14

PROJECT MANAGER J. KINMAN

FILE NO. 341140010

SCALE 1" = 80'

DATE 9/20/18

FIGURE NO. 13

WILCOX ENVIRONMENTAL ENGINEERING

MW-11	07/31/18	08/29/18
PCE–	<5.0 ug/L	<5.0 ug/L
pH–	6.87 standard	7.16 standard
CONDUCTIVITY–	1.080 mS/cm	0.970 mS/cm
DISSOLVED OXYGEN–	7.44 mg/L	4.55 mg/L
TEMPERATURE–	21.29 C	25.46 C
OXIDATION REDUCTION POTENTIAL–	147 mV	106 mV
TURBIDITY–	9.5 NTUs	0.0 NTUs
NITRATE–	13.5 mg/L	11.7 mg/L
NITRITE–	13.5 mg/L	<1.0 mg/L
TOTAL IRON–	1,980 ug/L	994 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	122 ug/L	79.4 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	286 mg/L	313 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<3.0 mg/L
SULFATE–	56.2 mg/L	73.3 mg/L

MW-9	07/30/18	08/29/18
PCE–	291 ug/L	<5.0 ug/L
pH–	7.06 standard	7.47 standard
CONDUCTIVITY–	0.927 mS/cm	1.080 mS/cm
DISSOLVED OXYGEN–	6.21 mg/L	0.00 mg/L
TEMPERATURE–	17.11 C	28.68 C
OXIDATION REDUCTION POTENTIAL–	132 mV	12.0 mV
TURBIDITY–	650 NTUs	108 NTUs
NITRATE–	7.9 mg/L	4.6 mg/L
NITRITE–	<0.20 mg/L	0.37 mg/L
TOTAL IRON–	1,740 ug/L	6,800 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	61.0 ug/L	1,780 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	1,680 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	11.6 ug/L
ALKALINITY–	280 mg/L	297 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	66.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<12.0 mg/L
SULFATE–	19.9 mg/L	30.8 mg/L

MW-10	07/30/18	08/29/18
PCE–	15.2 ug/L	<5.0 ug/L
pH–	6.98 standard	7.27 standard
CONDUCTIVITY–	1.220 mS/cm	1.110 mS/cm
DISSOLVED OXYGEN–	7.64 mg/L	0.00 mg/L
TEMPERATURE–	18.84 C	7.27 C
OXIDATION REDUCTION POTENTIAL–	119 mV	–77.0 mV
TURBIDITY–	9.2 NTUs	303 NTUs
NITRATE–	11.4 mg/L	1.7 mg/L
NITRITE–	<1.0 mg/L	0.40 mg/L
TOTAL IRON–	1,260 ug/L	20,700 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	53.0 ug/L	2,430 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	1,930 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	34.10 ug/L
ALKALINITY–	283 mg/L	520 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	75.7 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<12.0 mg/L
SULFATE–	37.3 mg/L	37.1 mg/L

MW-8	07/31/18	08/28/18
PCE–	67.8 ug/L	84.6 ug/L
pH–	6.99 standard	7.39 standard
CONDUCTIVITY–	1.220 mS/cm	0.87 mS/cm
DISSOLVED OXYGEN–	4.75 mg/L	3.67 mg/L
TEMPERATURE–	19.16 C	28.57 C
OXIDATION REDUCTION POTENTIAL–	154 mV	102 mV
TURBIDITY–	12.7 NTUs	137 NTUs
NITRATE–	7.5 mg/L	7.6 mg/L
NITRITE–	7.6 mg/L	<0.50 mg/L
TOTAL IRON–	<100 ug/L	551 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	13.5 ug/L	287 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	<5.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	271 mg/L	280 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<12.0 mg/L
SULFATE–	23.1 mg/L	23.0 mg/L

MW-9D	07/30/18	08/29/18
PCE–	82.4 ug/L	10.6 ug/L
pH–	6.97 standard	7.21 standard
CONDUCTIVITY–	0.808 mS/cm	0.069 mS/cm
DISSOLVED OXYGEN–	0.71 mg/L	2.74 mg/L
TEMPERATURE–	15.72 C	27.29 C
OXIDATION REDUCTION POTENTIAL–	130 mV	–17.0 mV
TURBIDITY–	16.5 NTUs	181 NTUs
NITRATE–	1.6 mg/L	0.5 mg/L
NITRITE–	<0.10 mg/L	<0.10 mg/L
TOTAL IRON–	480 ug/L	3,620 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	13.8 ug/L	418 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	197 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	350 mg/L	391 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	20.7 mg/L
BIOLOGICAL OXYGEN DEMAND–	2.0 mg/L	<12.0 mg/L
SULFATE–	18.5 mg/L	24.2 mg/L

MW-19	07/30/18	08/29/18
PCE–	<5.0 ug/L	67.8 ug/L
pH–	6.93 standard	7.24 standard
CONDUCTIVITY–	1.050 mS/cm	0.846 mS/cm
DISSOLVED OXYGEN–	4.48 mg/L	6.33 mg/L
TEMPERATURE–	19.38 C	21.72 C
OXIDATION REDUCTION POTENTIAL–	155 mV	149 mV
TURBIDITY–	>1,000 NTUs	11.4 NTUs
NITRATE–	3.4 mg/L	7.3 mg/L
NITRITE–	<0.10 mg/L	<0.20 mg/L
TOTAL IRON–	10,900 ug/L	791 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	910 ug/L	195 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	383 mg/L	343 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<12.0 mg/L
SULFATE–	19.7 mg/L	52.1 mg/L

MW-24	07/30/18	08/30/18
PCE–	79.8 ug/L	108 ug/L
pH–	6.95 standard	6.79 standard
CONDUCTIVITY–	0.941 mS/cm	0.940 mS/cm
DISSOLVED OXYGEN–	5.85 mg/L	6.77 mg/L
TEMPERATURE–	18.50 C	21.52 C
OXIDATION REDUCTION POTENTIAL–	139 mV	177 mV
TURBIDITY–	17.0 NTUs	119 NTUs
NITRATE–	6.7 mg/L	9.5 mg/L
NITRITE–	<0.20 mg/L	9.50 mg/L
TOTAL IRON–	1,750 ug/L	21,200 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	170 ug/L	1,120 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	356 mg/L	360 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	76.7 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<2.0 mg/L
SULFATE–	95.4 mg/L	27.9 mg/L

MW-17	07/30/18	08/28/18
PCE–	16.7 ug/L	26.3 ug/L
pH–	6.90 standard	7.20 standard
CONDUCTIVITY–	0.885 mS/cm	0.763 mS/cm
DISSOLVED OXYGEN–	7.56 mg/L	5.31 mg/L
TEMPERATURE–	19.89 C	21.55 C
OXIDATION REDUCTION POTENTIAL–	196 mV	112 mV
TURBIDITY–	164 NTUs	5.1 NTUs
NITRATE–	2.8 mg/L	6.9 mg/L
NITRITE–	<0.10 mg/L	<0.50 mg/L
TOTAL IRON–	11,900 ug/L	351 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	489 ug/L	35.2 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	408 mg/L	312 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<12.0 mg/L
SULFATE–	23.0 mg/L	25.8 mg/L

MW-26	07/31/18	08/29/18
PCE–	124 ug/L	154 ug/L
pH–	6.89 standard	7.03 standard
CONDUCTIVITY–	0.835 mS/cm	0.861 mS/cm
DISSOLVED OXYGEN–	3.65 mg/L	2.25 mg/L
TEMPERATURE–	20.37 C	21.61 C
OXIDATION REDUCTION POTENTIAL–	21.0 mV	135 mV
TURBIDITY–	143 NTUs	48.2 NTUs
NITRATE–	5.9 mg/L	9.2 mg/L
NITRITE–	5.90 mg/L	<1.0 mg/L
TOTAL IRON–	625 ug/L	45,000 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	88.1 ug/L	423 ug/L
DISSOLVED MANGANESE–	57.5 ug/L	354 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	273 mg/L	312 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	46.8 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<20.0 mg/L
SULFATE–	13.3 mg/L	15.8 mg/L

MW-16	07/31/18	08/29/18
PCE–	18.8 ug/L	20.3 ug/L
pH–	7.00 standard	6.73 standard
CONDUCTIVITY–	0.879 mS/cm	0.781 mS/cm
DISSOLVED OXYGEN–	6.24 mg/L	4.36 mg/L
TEMPERATURE–	19.19 C	18.97 C
OXIDATION REDUCTION POTENTIAL–	124 mV	155 mV
TURBIDITY–	220 NTUs	36.4 NTUs
NITRATE–	2.7 mg/L	2.4 mg/L
NITRITE–	2.70 mg/L	<0.10 mg/L
TOTAL IRON–	603 ug/L	1,120 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	39.0 ug/L	136 ug/L
DISSOLVED MANGANESE–	<5.0 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	322 mg/L	378 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<12.0 mg/L
SULFATE–	12.3 mg/L	13.9 mg/L

MW-15D	07/30/18	08/29/18
PCE–	<5.0 ug/L	<5.0 ug/L
pH–	6.92 standard	7.22 standard
CONDUCTIVITY–	0.820 mS/cm	0.762 mS/cm
DISSOLVED OXYGEN–	0.05 mg/L	0.00 mg/L
TEMPERATURE–	17.73 C	18.89 C
OXIDATION REDUCTION POTENTIAL–	142 mV	117 mV
TURBIDITY–	>1,000 NTUs	57.6 NTUs
NITRATE–	2.0 mg/L	1.0 mg/L
NITRITE–	<0.10 mg/L	0.99 mg/L
TOTAL IRON–	3,310 ug/L	631 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	148 ug/L	18.5 ug/L
DISSOLVED MANGANESE–	51.7 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	12.60 ug/L
METHANE–	<10.0 ug/L	10.10 ug/L
ALKALINITY–	390 mg/L	333 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<3.0 mg/L
SULFATE–	20.2 mg/L	25.6 mg/L

MW-15	07/30/18	08/30/18
PCE–	165 ug/L	128 ug/L
pH–	7.01 standard	7.29 standard
CONDUCTIVITY–	0.765 mS/cm	0.778 mS/cm
DISSOLVED OXYGEN–	5.97 mg/L	4.42 mg/L
TEMPERATURE–	20.06 C	22.88 C
OXIDATION REDUCTION POTENTIAL–	11.0 mV	159 mV
TURBIDITY–	272 NTUs	18.2 NTUs
NITRATE–	7.6 mg/L	9.4 mg/L
NITRITE–	<0.20 mg/L	9.4 mg/L
TOTAL IRON–	1,200 ug/L	631 ug/L
DISSOLVED IRON–	<70.0 ug/L	<100 ug/L
TOTAL MANGANESE–	90.6 ug/L	166 ug/L
DISSOLVED MANGANESE–	21.9 ug/L	<10.0 ug/L
ETHENE–	<10.0 ug/L	<10.0 ug/L
METHANE–	<10.0 ug/L	<10.0 ug/L
ALKALINITY–	288 mg/L	308 mg/L
CHEMICAL OXYGEN DEMAND–	<10.0 mg/L	<10.0 mg/L
BIOLOGICAL OXYGEN DEMAND–	<6.0 mg/L	<3.0 mg/L
SULFATE–	18.2 mg/L	18.8 mg/L

TETRACHLOROETHENE ISOCONCENTRATION - SHALLOW WELL LOCATIONS
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN
WILCOX PROJECT # 341.14
PROJECT MANAGER J. KINMAN
FILE NO. 34114004
SCALE 1" = 80'
DATE 10/29/19
FIGURE NO. 15
WILCOX ENVIRONMENTAL ENGINEERING
E. MORGAN ST.
E. WASHINGTON ST.
JACKSON ST.
E. COLUMBUS ST.
N. JEFFERSON ST.
N. SYCAMORE ST.
N. WAYNE ST.
N. OHIO ST.
N. GRAHAM ST.
N. LINCOLN ST.
S. GRANT ST.
N. COLFAX ST.
ALLEY
0 20 40 60 80 160 FT.
LEGEND
MW-1 MONITORING WELL LOCATION WITH ID
HA-1 HAND AUGER LOCATION WITH ID
B-4 SOIL BORING LOCATION WITH ID
MANHOLE
LIGHT POLE
UTILITY POLE
WATER METER
ELECTRICAL LINE
OVERHEAD UTILITY LINE
WATER LINE
SEWER LINE
GAS LINE
COMMUNICATION LINE
UNKNOWN LINE
SANITARY SEWER LATERAL
PROPERTY LINE
5 µg/L RESIDENTIAL GROUNDWATER TAP SCREENING LEVEL TETRACHLOROETHENE ISOCONCENTRATION LINE
110 µg/L RESIDENTIAL VAPOR INTRUSION GROUNDWATER SCREENING LEVEL (VIGWSL) TETRACHLOROETHENE ISOCONCENTRATION LINE
PROPOSED INJECTION AREAS
JULY/AUG 2018 ISCR PILOT TEST LOCATION
ACCESS GRANTED/COMPLIANT VI SAMPLING RESULTS
ACCESS DENIED
ACCESS GRANTED, UNRESPONSIVE TO VI SAMPLE COLLECTION SCHEDULING REQUESTS
ACCESS NOT GRANTED NOR DENIED
VAPOR MITIGATION SYSTEM OPERATION
* INDICATES MIP SAMPLING LOCATION
GROUNDWATER ANALYTICAL RESULTS ARE REPORTED IN MICROGRAMS PER LITER (µg/L); OBTAINED DURING THE MAY 20-23, 2019 SAMPLING EVENT.

APPENDIX A

RWP Checklist

REMEDIATION WORK PLAN COMPLETENESS CHECKLIST
State Form 53413 (R / 2-13)

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY
VOLUNTARY REMEDIATION SECTION
100 N. Senate Avenue
Indianapolis, IN 46204-2251

*INSTRUCTIONS: This checklist shall be **completed and returned** for all Remediation Work Plan (RWP) submittals required under IC 13-25-5-7. When completed, please return this form and support documents to the address given in the box above.*

The RWP provides the basis for IDEM to evaluate the proposed remedy for each VRP site. All of the following information is required to evaluate the selected remedy's effectiveness and to demonstrate that it is the most effective remedy for the site. The remediation work plan must provide a complete description of the past operations, the site investigation and the selected remedy for the site.

Required Elements	Present	Location
Site Delineated *(Required for Approval)*	*If "No" Explain*	Yes: Sections 1.2, 2.6.4, and 2.7.2
2 Paper Copies and 1 Electronic Copy of RWP *(Large QA/QC data packets can be submitted as 1 electronic copy)*	REQUIRED	Yes

I. INTRODUCTION

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. Sources of contamination 1. Site name, address, and telephone	Yes	1.1.1
2. Current owner and contact information	Yes	1.1.2
3. Historical summary of site ownership	Yes	1.1.3
4. Type of facility, past and present operations	Yes	1.1.3
5. Site contact responsible for VRP process	NA	1.1.2
6. Overview of initial discovery of contamination, spill history, & previous investigations conducted at the site	Yes	1.1.4
B. Supporting Documents 1. Discussion of relevant previous reports	Yes	1.2
2. Data and documentation regarding site	Yes	
C. Remedial Action Objectives 1. Remediation and cleanup objectives for all affected source areas, media, contaminants, and exposure pathways	Yes	1.4
2. Work items planned for remediation	Yes	1.4

II. INVESTIGATION ACTIVITIES

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. Summary of Information Used to Select Remedy 1. Baseline assessment and literature search a. Geologic and hydrogeologic summary	Yes	2.1, 2.2, 2.3, 2.4
b. Physical and political geographic information	Yes	2.5
2. Extent of subsurface work, including: a. Copies of all boring logs and monitoring well construction logs	Yes	Appendix D
b. Boring and well location maps	Yes	Figure 3
c. Field screening results for soils and groundwater	Yes	Appendix D
d. Sample location map, cross sections, groundwater flow, and isoconcentrations maps	Yes	Figure 3, Figure 6, Figure 7, Figure 10

Report/Plan Element	Present (Y,N, or NA)	Location in Document
B. Summary of Site Investigation 1. Identification of all contaminants a. Chemical and physical properties	Yes	2.6.5.1
b. Contaminant toxicological data	Yes	Appendix K
c. Potential effects of residual contamination	Yes	Appendix K
2. Summary of site-specific Geology & Hydrogeology	Yes	2.2, 2.3, 2.4
3. Discussion of Sources of Contamination	Yes	2.7.1
4. Summary and Map of Extent of Contamination a. Impacted media, such as soil, soil vapor, sediment, groundwater, surface water, and air	Yes	2.7.2, Figure 5, Figure 8, Figure 10
b. Concentrations of contaminants with tables	Yes	Table 8, Table 9, Table 11
c. Concentration trends	Yes	Appendix L
C. Summary of Risks Associated with Site 1. Human, ecological, and environmental risks for each contaminant & impacted media, including discussion of long and short-term risks, environmentally sensitive areas, and endangered species	Yes	2.8
2. Impact of current and future land-use issues, if applicable, including need for environmental deed restrictions and restrictive ordinances	Yes	2.8
D. Background Concentration Assessment 1. Summary of naturally occurring site contaminants	NA	
2. Background data in tabular format & background sampling location map	NA	
3. Statistical comparison of background concentrations to concentrations in potentially contaminated media	NA	
4. Reliability and applicability of background data	NA	
E. Additional Field Investigation Requirements 1. Additional investigations required to effectively complete the design or the installation of the selected remedial method	NA	
2. Reasons for additional investigation	NA	
3. Description of additional work to be completed	NA	

VAPOR INTRUSION

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. Discussion of ground water results compared with the Tables in the IDEM Remediation Closure Guide	Yes	2.9.1
B. Description of further monitoring required until detected levels are below the screening levels in the Remediation Closure Guide	Yes	2.10

III. REMEDIATION PLAN

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. Evaluation of Remedial Alternatives 1. The remedial alternatives evaluated must be identified, and the rationale for their selection must be provided. In addition, the remediation work plan should describe parameters evaluated for each of the selected alternatives. The parameters should include, but not necessarily be limited to, the following: a. Extent of remediation effort	Yes	3.2, Table 12
b. Technical feasibility to address physical and chemical characteristics of media	Yes	3.2, Table 12
c. Projected contamination removal & treatment rates	Yes	3.2, Table 12
d. Protectiveness of human health	Yes	3.2, Table 12
e. Cleanup criteria	Yes	3.2, Table 12
f. Ability of each alternative to achieve cleanup criteria	Yes	3.2, Table 12
g. Community acceptance	Yes	3.2, Table 12
h. Anticipated volume of contaminated materials to be treated	NA	
i. Ease of technology application or implementation	Yes	3.2, Table 12
j. Dimensions of major technologies & space limitations	Yes	3.2, Table 12
k. Process parameters	NA	
l. Clean up time frames	Yes	3.2, Table 12
m. Transportation distances	NA	
n. O&M Costs	NA	
o. Any other special considerations	NA	
2. Summarize conclusions for each of the technologies evaluated, and provide reasons each technology would or would not be appropriate	Yes	3.2, Table 12
3. Need for treatability study or pilot test. Describe the treatability study or pilot test and the reasons it is required, and provide the following information: a. Proposed study methodology	Yes	3.2.8, Appendix P
b. Clear statement of treatability study or waste characterization objectives	Yes	3.2.8, Appendix P
c. Proposed scale of study (e.g., bench, pilot, etc.)	Yes	3.2.8, Appendix P
d. Data requirements and evaluation	Yes	3.2.8, Appendix P
e. Pilot plan startup and O&M	Yes	3.2.8, Appendix P
f. Schedule for pilot study	Yes	3.2.8, Appendix P
g. Remedial technologies to be tested & equipment required	Yes	3.2.8, Appendix P
h. Treatability assessment and waste characterization	Yes	3.2.8, Appendix P
i. Proposed disposal arrangements for wastes caused during remediation, plus approvals & necessary documentation	NA	
j. Installation and startup procedures, including: - Data requirements and analytical methods	Yes	3.2.8, Appendix P
- Pilot Plan O&M requirements	NA	
- Data analysis & interpretation of results to be used	Yes	3.2.8, Appendix P
- Full-scale technology application requirements and notation of limitations & optimum operating conditions	Yes	3.3

Report/Plan Element	Present (Y,N, or NA)	Location in Document
B. Selected Remediation Technology – If more than one remedial alternative will be used to address different on-site areas, the remediation work plan must describe how the remediation system, as a whole, will work. A flow diagram, conceptual sketch, or other approach should be used to illustrate the components of the remediation system. Major equipment, such as pumps, air strippers, and in-situ treatment equipment, must be indicated. The work plan should include a site map showing areas to be remediated and proposed locations of major equipment. 1. Identify which evaluated technology or combination of technologies will be implemented at the site, including the technical, economic and social acceptance rationales for the final selection.	Yes	3.3
2. Identify the need for risk assessment and provide: a. Parameters to be addressed	Yes	3.3
b. Proposed risk assessment methodologies	Yes	3.3, 3.5, 3.6
c. Potential exposure pathways	Yes	3.3
d. Exposure assumptions	NA	
e. Environmental fate and transport data	Yes	3.3
f. Tabulated parameters and resulting cleanup levels	Yes	Table 4
3. Provide a detailed description of the selected technology and system setup, including the following information: a. Technical specifications of all equipment & processes	Yes	3.3
b. Proposed locations of all remediation equipment on a scaled site map, including piping runs and electrical wiring where applicable	Yes	Figure 15
c. State or federal permit requirements for the system	NA	
d. Waste disposal approvals needed to implement system	NA	
C. Monitoring and Sampling Plan 1. Sampling plan details, including: a. Sampling and monitoring parameters	Yes	3.4
b. Sampling and monitoring frequency	Yes	3.4, 3.7, Table 14
c. Schedule for submitting results to IDEM for review and evaluation (quarterly progress reporting is minimum requirement)	Yes	3.4, 3.7, Table 14
Provide data management details, including a discussion of how the monitoring & confirmation sampling data will be documented & reported, & proposed progress reports formatting	Yes	3.4, 3.7, Table 14, Appendix K
D. Project Work Schedule 1. Projected installation and startup	Yes	3.8, Table 15
2. Sampling and monitoring schedule	Yes	3.8, Table 15
3. Contaminant removal & treatment rates, including remediation progress milestones & projected completion dates	Yes	3.8, Table 15
4. O&M Plan, including: a. Optimal operating conditions	Yes	Appendix E
b. Necessary O&M tasks, their frequency, replacement schedule & planned O&M replacement events	Yes	Appendix E
c. Proposed inspection schedule	Yes	Appendix E

Report/Plan Element		Present (Y,N, or NA)	Location in Document
	d. Potential problems and their remedies	Yes	3.2
	e. Contingency plan indicating how the applicant plans to respond in the event of a system failure, including the following information: - Description of alternate operation procedures to prevent undue hazards if the system fails	NA	
	- Notification procedure for system shutdown or failure	NA	
	- System modification procedures	NA	
5.0	RISK ASSESSMENT *(if applicable, appendix to the Remediation Work Plan)*	Yes	2.8
A.	List of parameters to be addressed by Risk Assessment	No	
B.	Description of proposed Risk Assessment methodologies (e.g., types of modeling)	No	
C.	Identification of potential pathways of exposure	Yes	2.8
D.	Identification of exposure assumptions	No	
E.	Environmental Fate and Transport data development procedures	Yes	2.8
F.	Summary table listing parameters and calculated cleanup levels	Yes	Table 4
G.	List all Lines of Evidence to demonstrate that exposure pathways are incomplete and will remain incomplete (required for closure with levels above RCG screening levels)	Yes	2.6.6, 2.8, 2.9

IV. REFERENCES

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. References used to prepare remediation work plan should be cited or listed, including author, full title, publisher, company, date, etc.	Yes	6.0

V. APPENDICIES

Report/Plan Element	Present	Location in Document
A. A QAPP is required for the remediation work plan. The QAPP should contain all elements discussed on page 29 of the Remediation Closure Guide (RCG). If a QAPP was submitted as part of the investigation report, it need not be re-submitted.	Y	Appendix K
B. A site Health and Safety Plan is required.	Y	Appendix K

VI. ENVIRONMENTAL RESTRICTIVE COVENANT OR ORDINANCE

Report/Plan Element	Present (Y,N, or NA)	Location in Document
Text of the restrictions or ordinance	Yes	3.9, Appendix S
Table of Last Known Concentrations of COC's and the closure standard	Yes	Table 4, Table 9
Site Plan showing covered areas with detailed boundary description. IDEM data policy for reference: http://www.in.gov/idem/files/olq_spatial_data_collection_standards.pdf	Yes	Figure 3

OTHER VRP REQUIREMENTS

COMMUNITY RELATIONS

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. Mailing list of nearby properties; interested community groups; and local, state, and national officials (e.g., mayor, local newspaper, county health department, representatives, and senators).	Y	4.0
B. Name and address of local library that will be the repository for the Remediation Work Plan during the public notice period.	Y	4.0
C. Copy of the RWP notification letter	Y	4.0

PUBLIC MEETINGS

Report/Plan Element	Present (Y,N, or NA)	Location in Document
A. Discussion of plans to hold public information meetings about the proposed remediation process.	Yes	4.0
B. Format of meetings.	No	
C. Proposed public meeting schedule and notification procedures.	No	
D. Discussion of plans to prepare and distribute information bulletins regarding the remediation system.	No	
E. Description of the format and types of information included in the bulletins.	No	
F. Description of the types of media that will be used to inform the general public (newspaper, radio, etc.).	No	
G. Description of the type of information that will be released to the media.	No	

COMPLETION OF REMEDIAL ACTION

COMPLETION REPORT

Report/Plan Element	Present	Location in Document
A. Statement that a Completion Report detailing the remediation system and confirmation sampling will be submitted upon completion of the remediation to the cleanup criteria.	Y	4.1

APPENDIX B

Sewer Investigation Information

WILCOX
ENVIRONMENTAL ENGINEERING

Appendix B-
Sewer Camera Investigation Area

O'Neal's Clothes Depot
833 East Morgan Street
Martinsville, IN 46151

Project #: 341.14	PM: Kinman
Date: 10/05/2017	File #: 341.14-006
Drawn By: EO	Checked By: NM

Data Sources:
Basemap: ESRI, World Imagery

Sewer Camera Investigation Features
- Sewer Criss-Cross
- Sewer Manhole
- Sewer Obstruction
- Sanitary Sewer Approx. Location
- Length of Sewer Investigated

Sample Locations
- Monitoring Well
- Soil Boring

N

1 inch = 120 feet
0 60 120 180 240 Feet

APPENDIX C

MIP/HPT Report & Data Outputs

Stock Drilling, Inc.

MIHPT/LLMIHPT Boring Summary

Former O'Neil's Clothes Depot Cleaners
Martinsville, IN

Prepared for Wilcox Environmental

Prepared by Jonathan Wiley

Stock Drilling Inc.

P.O.Box 186

Ida, MI 48159

(734) 279-2059

Stock Drilling Direct Imaging

STOCK DRILLING SAVE THE EARTH Our Job is Boring!

LLMIHPT Boring Summary

Former O'Neil's Clothes Depot Cleaners Martinsville, IN

Index:

Introduction

The LLMIHPT investigation of Former O'Neil's Clothes Depot Cleaners took place on August 14, 2017 thru August 17, 2017. The investigation consisted of six LLMIHPT borings. The number and locations of the borings were specified by the Wilcox represenitive on site.

Project Summary

Monday, August 14, 2017

We arrived onsite at 12:05 PM. Prior to starting work, we went over the health and safety plan. We then began to flow check the MIP system for initial calibration. We did not encounter any issues and completed one LLMIHPT boring for the day.

Tuesday, August 15, 2017

Prior to starting work, we went over the health and safety plan. On boring LLMIP-02 we reached target depth but had a FID spike so we decided to push deeper. We ended at 61' due to being out of rods that were strung up. Prior to the next boring we strung up an additional rod to the tool string. During calibration of LLMIP-03 we found that our return flow was not matching the supply flow of the nitrogen trunk line gas. After some trouble shooting, we found that the supply line was loose. We tightened the line and resumed calibration. We completed two LLMIHPT borings for the day.

Wednesday, August 16, 2017

Prior to starting work, we went over the health and safety plan. During calibration of LLMIP-04 we found that we had low response. We changed out the membrane and continued with calibration. After boring LLMIP-04 was complete we installed a temp well at that location and collected a water sample. We completed two LLMIHPT borings for the day.

Thursday, August 17, 2017

We arrived onsite and had to find a new place to stage our support vehicles due to the owner not wanting us to park there anymore. Prior to starting work, we went over the health and safety plan. We did not encounter any issues and completed one LLMIHPT boring for the day wrapping up the LLMIHPT portion of the project.

General Observations/Notes

Breakdowns/Standbys: We encountered a gas line issue during the project and had to change out a membrane. We also had to move equipment due to a property owner.

Safety Incidents/Stop work: N/A

Validation/Sampling: Conformation borings and water samples were completed.

General Comments: Overall the investigation went well. The response of the MIHPT/LLMIHPT was very good at the various locations. We maintained a two-man MIHPT crew to expedite progress. Included with this summary is a flash drive containing all of the files for the project. The DI viewer software that is needed to view and alter the logs in their raw form is available for download at www.Geoprobe.com. There are copies of each log in a PDF format enclosed in the flash drive as well that can be viewed on any PDF reader.

Response Testing of Geoprobe® MIHPT/LLMIHPT

Response testing is used to evaluate the sensitivity of the probe, trunk line and the three detectors utilized. This is done through an aqueous phase response test using various compounds determined for the site. These recorded values are then compared to previous recorded values. Field testing is required before and after the first log, and after each additional log as a form of quality control. The HPT response test is utilized to detect any changes that occur in the HPT screen after it is advanced in the subsurface, and aids in accurately determining static water levels. Field testing is required before and after the first log, and after each additional log to verify the screen is not damaged or clogged. The response test of the EC is done through applying a Test Load. This test applies two different loads to the system that correlate to low and high conductivity readings that the system will see in the subsurface. This test provides the best information of how the system is calibrated and how it will map the encountered lithology.

MIP Function:

The carrier gas is sent from the MIP controller down the trunk line and swept behind a heated membrane in the probe. The carrier gas receives the contaminants that diffuse across the membrane from the soil and brings them to the surface through the trunk line. From here the carrier gas stream is directed into the detector chamber housed on a gas chromatograph for contaminant detection.

LLMIP Function:

In standard MIP operation, the carrier gas continually sweeps across the membrane transporting contaminates to the detectors at the surface. In the LL MIP method, the trunk line sweep flow is temporarily stopped when the MIP probe is brought to rest at a discrete depth in the soil. Stopping the sweep gas flow allows the contaminant concentration to build behind the membrane. This results in a larger and narrower contaminant response peak at the detectors for a given chemical concentration. Switching valves located inside the MP9000 create separate flow paths for the MIP trunk line and detectors; trunk line flow can be stopped and restarted without impacting detector baseline or stability. When the trunk line flow is restarted the contaminant mass (peak) is quickly swept to the surface and is routed to the detectors via a sample loop located in the MP9000.

Gas Phase Detector Operation:

Photo-Ionization Detector (PID)

The carrier gas stream flows through the detectors ionization chamber where it is continuously irradiated with high energy ultraviolet light. When compounds are present that have a lower ionization potential than the irradiating energy they are ionized. The ions that are formed are drawn to a collector electrode, which produces an ion current proportional to its compound mass. The resulting current is amplified and the output signal is received by the MIP controller for log generation. An ultraviolet lamp typically in the 10.2eV or 10.6eV range in used in this detector. The compounds that will ionize and thus be able to be seen under that energy are primarily carbon double bonds such as petroleum aromatics i.e. benzene and double bonded halogenated solvents i.e. trichloroethylene. Aliphatic or straight chain hydrocarbons, which result from petroleum weathering, and single bonded halogenated solvents typically have higher ionization potentials than the lamp and will not be seen by the PID. The PID is a non-destructive detector and is usually configured as the initial detector in a series.

Benefits: Non-destructive detector that is usually configured in series with another destructive detector. The PID can be used with other detectors such as the XSD to determine compound family.

Sensitivity: Good sensitivity to aromatic hydrocarbons, non-sensitive to aliphatic hydrocarbons. Good sensitivity to multi-bonded XVOCs but not single bonded XVOCs.

Flame Ionization Detector (FID)

The carrier gas is combusted and ionized in a hydrogen-air flame. The ionized products are passed through an electrode which creates a current that is converted to a voltage signal and outputted to the MIP controller for log generation. The voltage output is directly proportional to the amount of mass of carbon based molecules in the carrier gas. The FID output signal voltage is mass dependent. All VOCs will combust in the FID and can be seen if they are in high enough concentrations. The FID is a destructive detector and is typically in series behind the PID or configured as a stand-alone detector.

Benefits: Best use is as a confirmation detector and when mapping high concentration and product level plumes. The FID will respond to any VOC in high enough concentration.

Sensitivity: Generally low. Responds well to aliphatic hydrocarbons.
Highly sensitive to Methane.

Halogen Specific Detector (XSD)

The model 5360 XSD's reactor assembly is operated between 1,000^{o}C-1,100^{o}C in an oxidative state that converts halogenated organics into free halogen atoms. These halogen atoms are adsorbed onto the activated platinum surface of the detector probe assembly resulting in an increase thermionic emission. This emission current comprised of free electrons, negative and positive ions provides a corresponding voltage that is measured via an electrometer circuit in the detector controller. The detector controller then outputs the signal to the MIP controller for log generation. The XSD responses well to a wide variety of halogenated compounds especially chlorinated. The XSDs sensitivity and response is not reliant to the number of chlorine atoms on a molecule. The XSD responds equally well for Vinyl Chloride, c-1, 2-DCE, and TCE. The XSD is a destructive detector that is either mounted as a second detector in tandem with the PID or as a stand-alone detector.

Benefits: Responds well to halogenated especially chlorinated compounds. Insensitive to hydrocarbons, making it great for mixed plumes. The XSD response is not influenced by the number of halogen atoms on a molecule. The XSD is linear response over 4 orders of magnitude.

Sensitivity: Highly sensitive to chlorinated VOCs, good but lower sensitivity to other halogenated molecules.

HPT Function:

The HPT system is designed to evaluate the hydraulic behavior of unconsolidated materials. As the probe is pushed or hammered at 2cm/s, clean water is pumped through a screen on the side of the HPT probe at a low flow rate, usually less than 300 mL/min. Injection pressure, which is monitored and plotted with depth, is an indication of the hydraulic properties of the soil. That is, a relatively low-pressure response would indicate a relatively large grain size, and the ability to easily transmit water. A relatively high-pressure response, however, would indicate a relatively small grain size and the lack of ability to transmit water. The probe assembly consists of the section that houses the 100-psi pressure transducer, water and electrical connections, and the probe body with the injection screen and electrical conductivity Wenner array. Injecting water at a constant rate is integral to system operation. A controller box houses components that monitor and regulate the water injection rate and pressure, as well as pressure transducer signal conditioning electronics. The flow rate, up to 1000 mL/min, is set manually on the front of the controller, and a valve is used to turn on or shut off flow. A vane pump provides system pressure ensuring adequate flow to the screen. The pump is secured to a frame with an integrated visual flow meter, and connects to the controller using a hose with quick connect fittings on each end. Water and power are transmitted from the controller to the probe assembly via the trunk line. Data collection occurs in real time by connecting the controller to the field instrument. The field instrument collects, stores and displays transducer pressure, flow rate and electrical conductivity, line pressure, probe rate, and diagnostic parameters, with depth.

Since the HPT pressure response is analogous to relative changes in the ability to transmit water (and therefore the relative change in dominant grain size), the HPT system can be used to identify potential contaminant migration pathways.

The HPT system also can be used to collect profiles of static water pressure data, which can be used to calculate static water levels.

EC Function:

A Wenner array is integrated into the MIHPT probe. This allows collection of soil electrical conductivity (EC) data for lithologic interpretation. In general, the higher the electrical conductivity value, the smaller the grain size, and vice versa. However, other factors can affect EC, such as mineralogy and pore water chemistry (brines, extreme pH, contaminants).

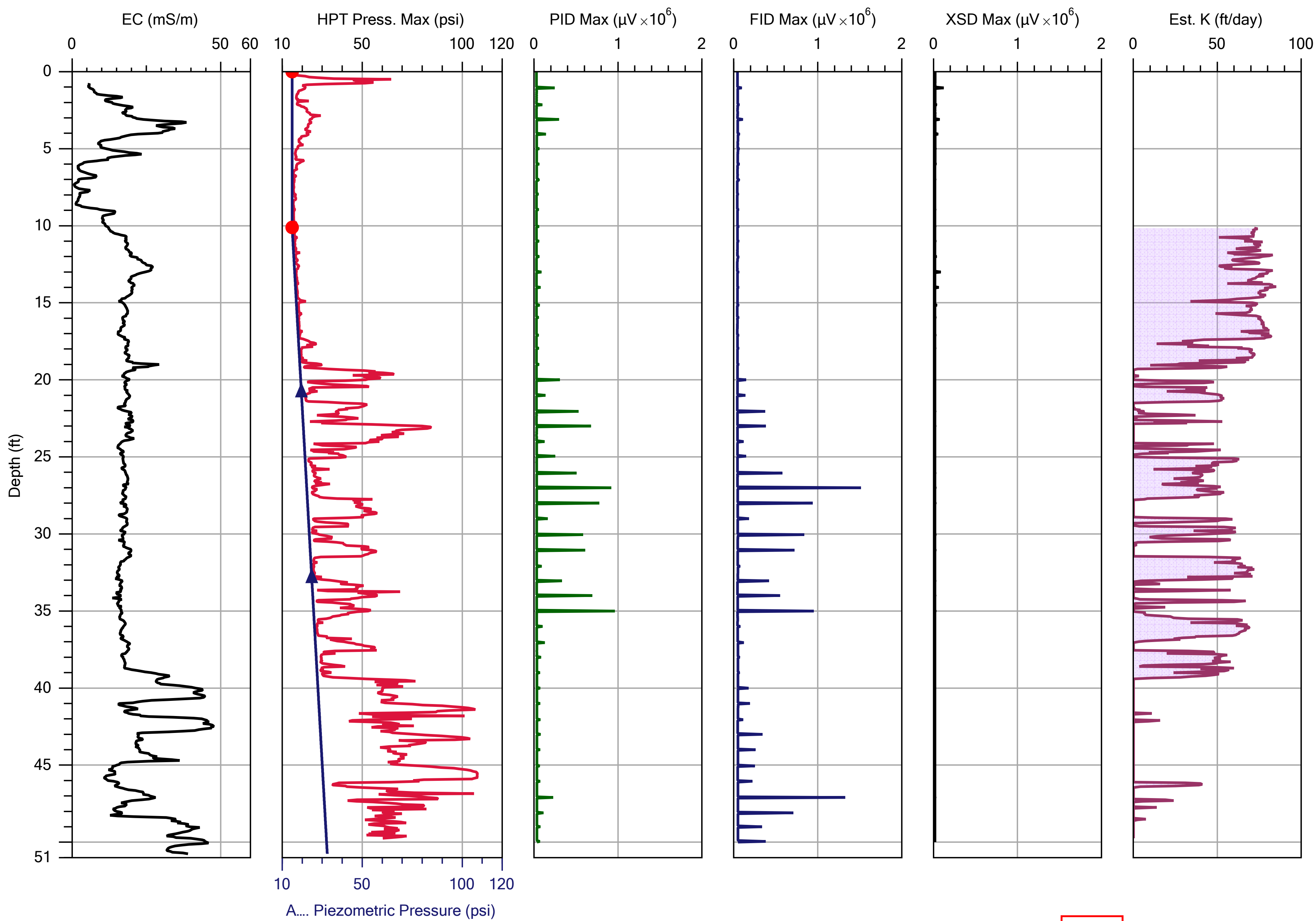
Disclaimer:

The analysis and opinions expressed in this report are based upon data obtained from the samples collected at the indicated locations and from other information discussed in this report. Exceptions, if any, are discussed in the Project Summary. This report is prepared for the exclusive use of our client for their specific application to the project discussed and has been prepared in accordance with generally accepted practices. Reported results shall not be reproduced, except in full, without written approval of Stock Drilling Inc. The sample results relate only to the analytes of locations tested. No warranties, expressed or implied are intended or made.

I certify that the data contained in this final report has been generated and reviewed in accordance with approved methods and our Standard Operating Procedure. Release of this final report is authorized Stock Drilling Inc., which is verified by the following signature.

____ 8-29-2017

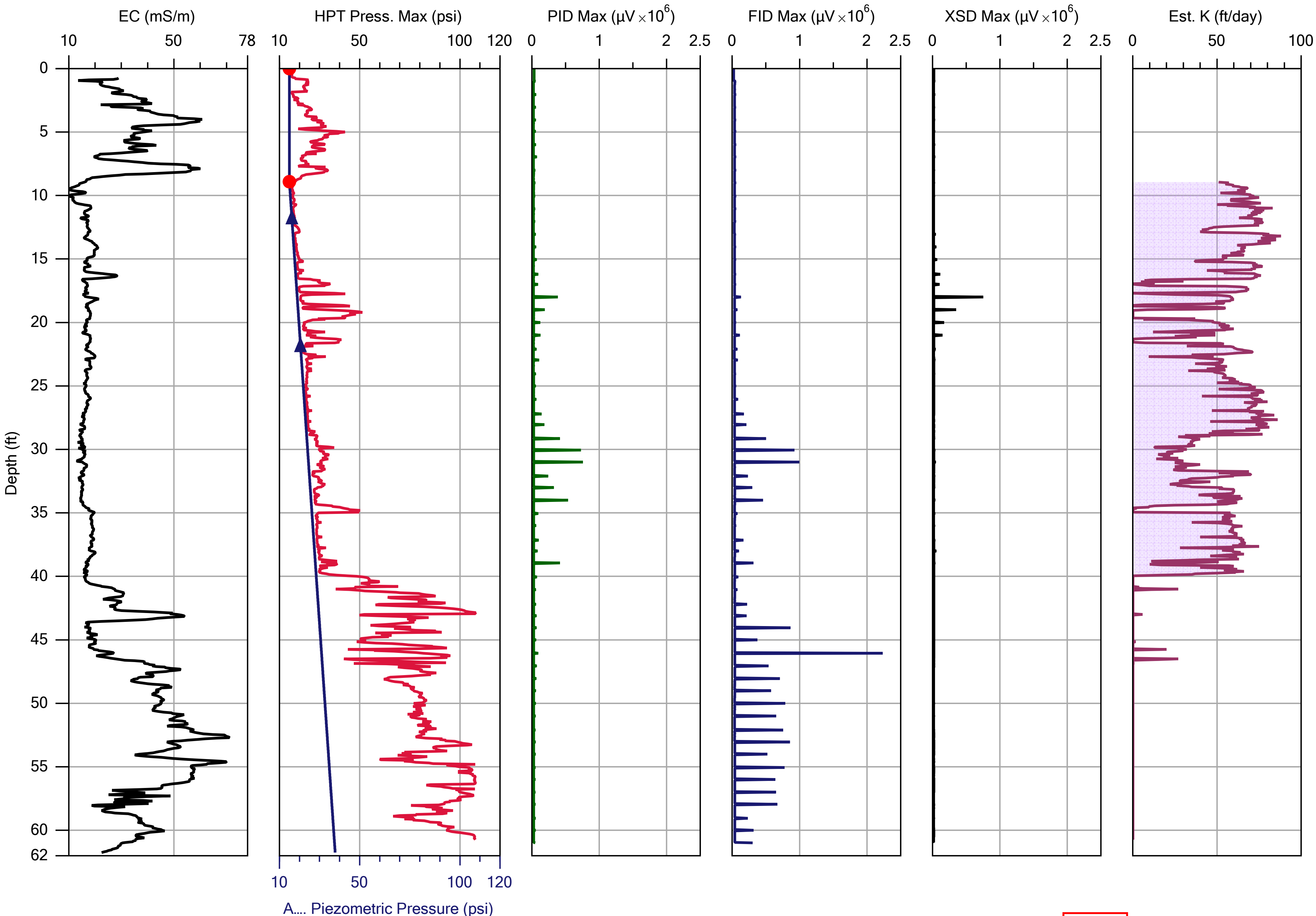
Approval Signature Date



B-45

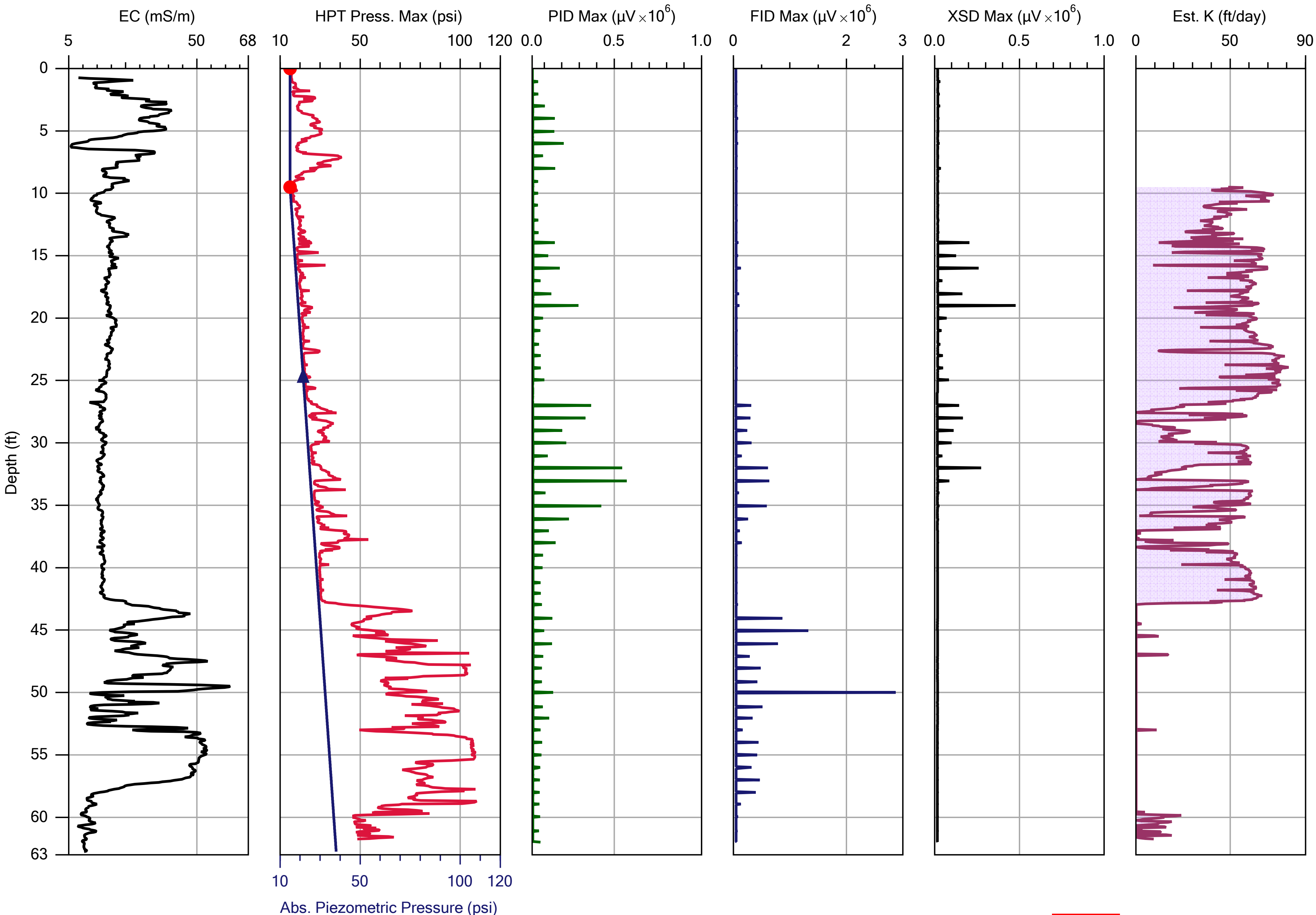
		File: LLMIP - 01.MHP
Company: Stock Drilling Inc.	Operator: Ben L	Date: 8/14/2017
Project ID: Former O'Neil's	Client: Wilcox	Location: 39° 25′ 38″ N, 86° 25′ 10″ W

STOCK DRILLING SAVE THE EARTH Our Job is Boring!



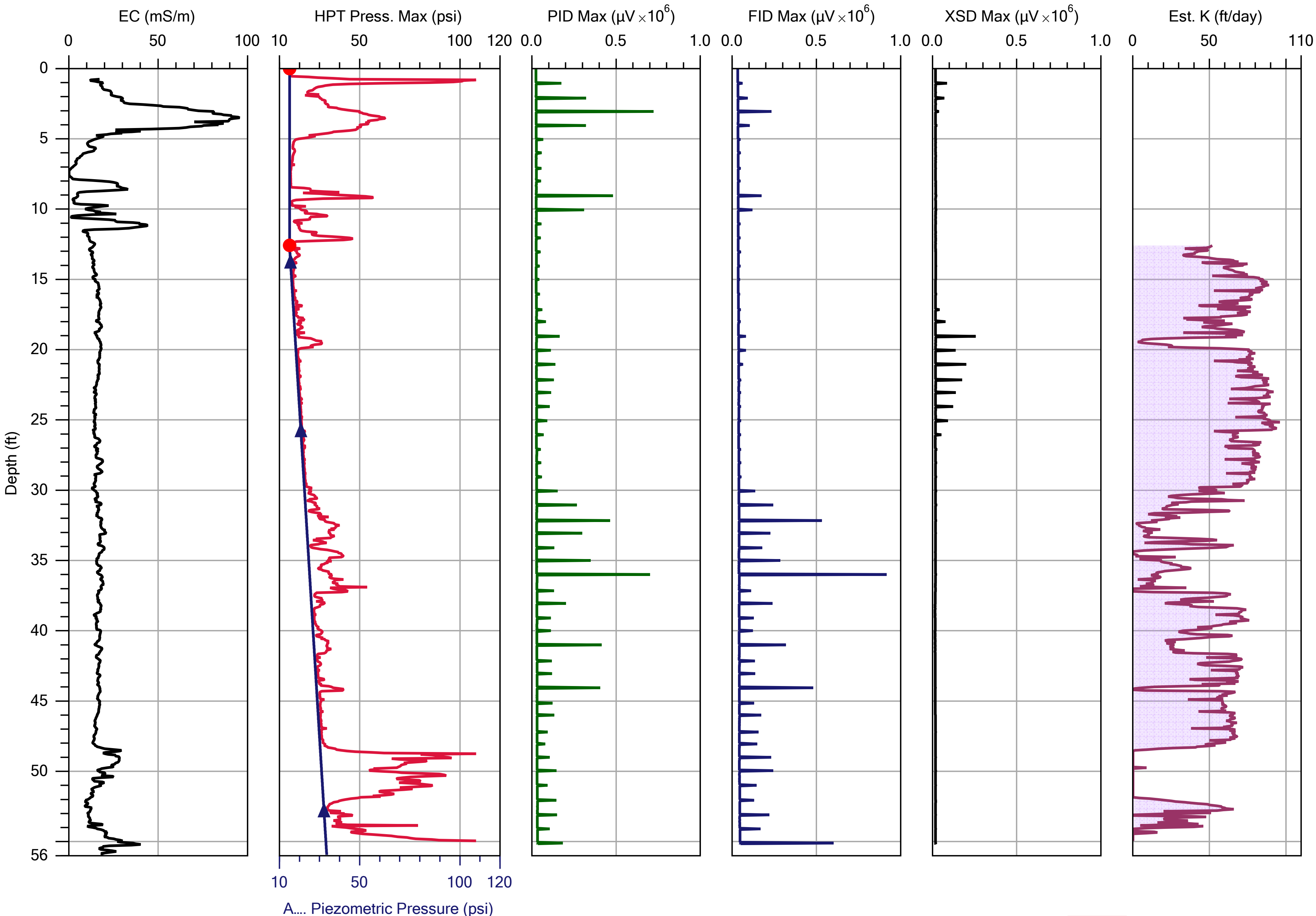
B-46

		File: LLMIP - 02.MHP
Company: Stock Drilling Inc.	Operator: Ben L	Date: 8/15/2017
Project ID: Former O'Neil's	Client: Wilcox	Location: 39° 25′ 37″ N, 86° 25′ 13″ W

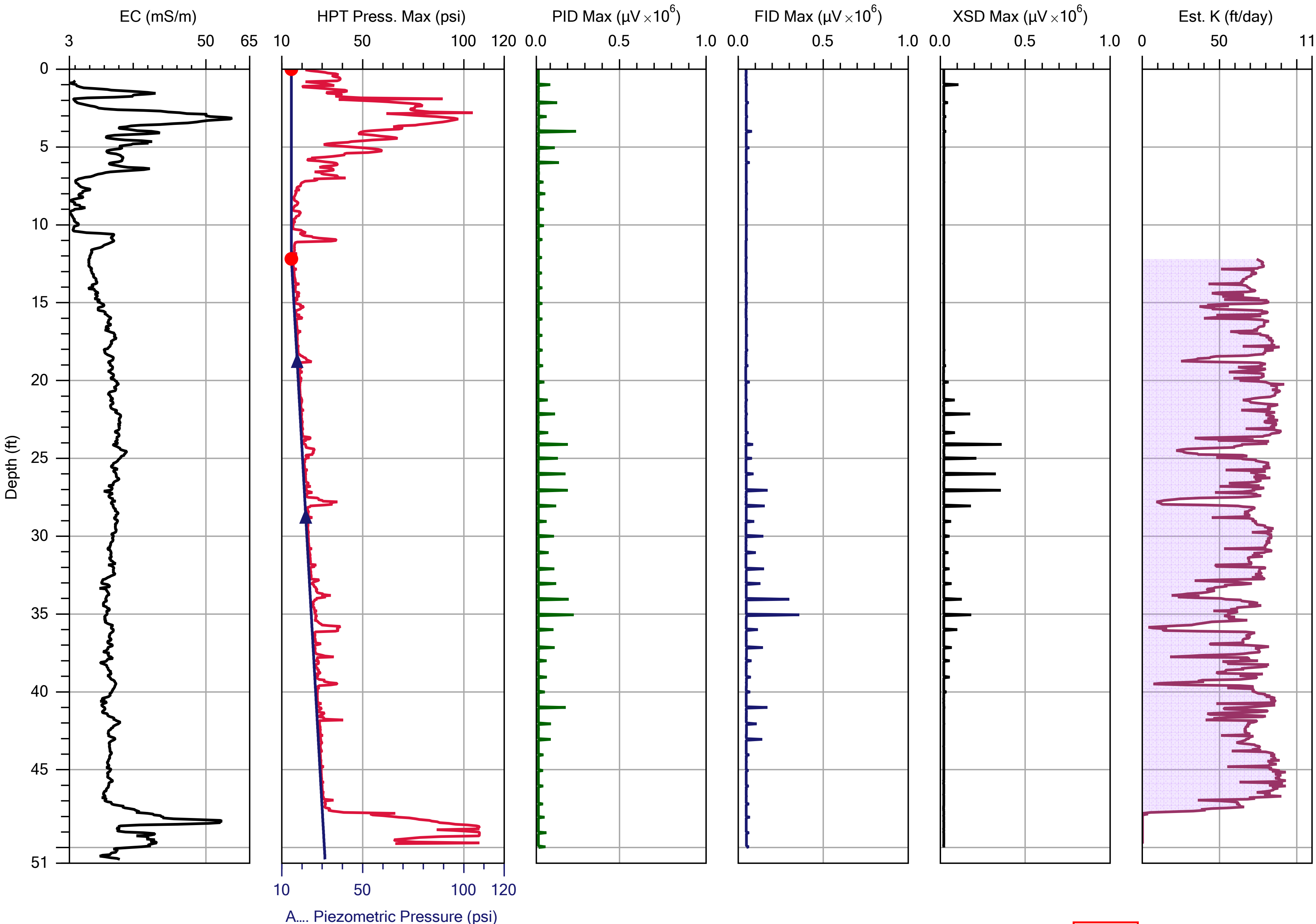


B-47

		File: LLMIP - 03.MHP
Company: Stock Drilling Inc.	Operator: Ben L	Date: 8/15/2017
Project ID: Former O'Neil's	Client: Wilcox	Location: 39° 25′ 37″ N, 86° 25′ 16″ W



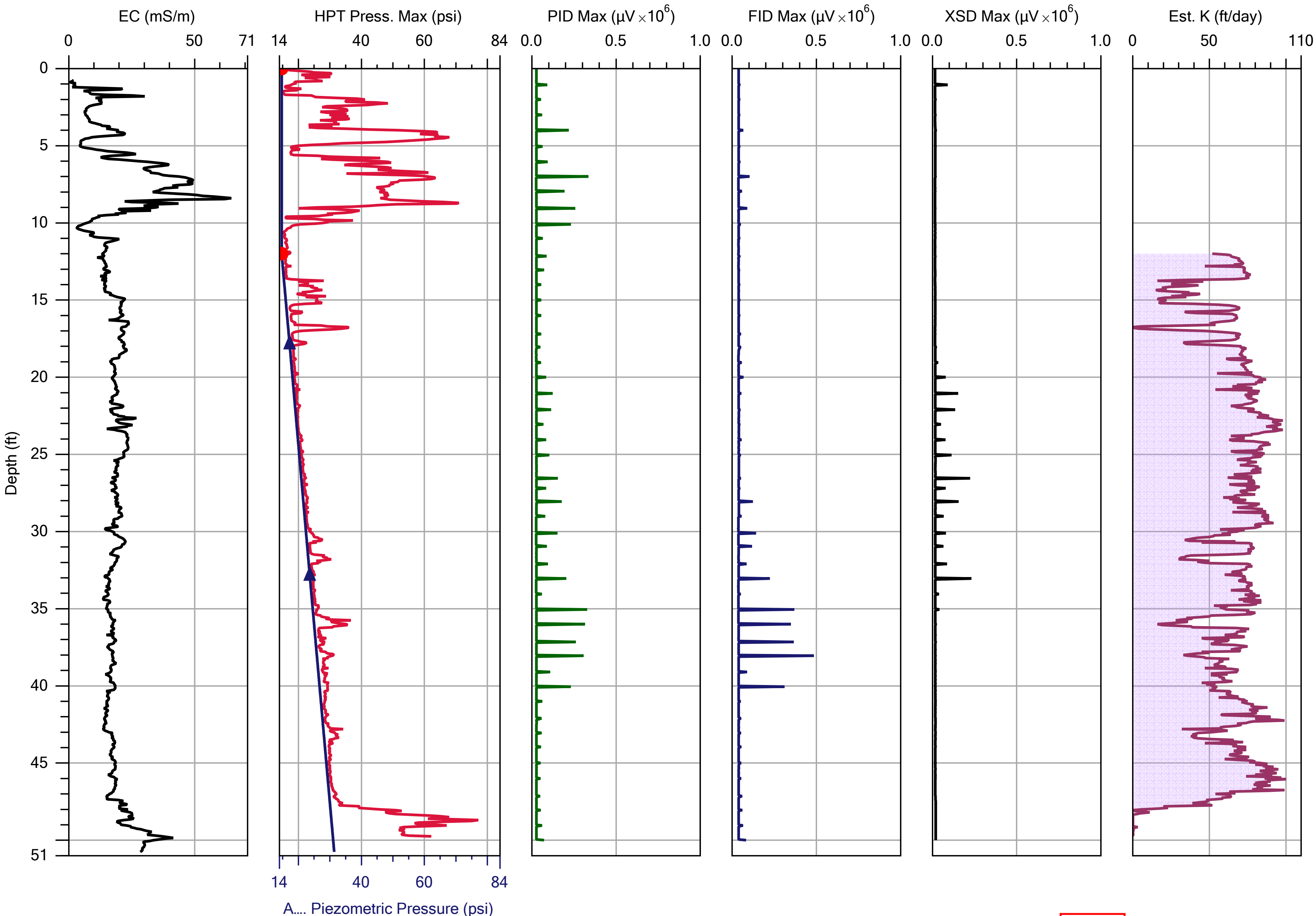
		File: LLMIP - 04.MHP
Company: Stock Drilling Inc.	Operator: Ben L	Date: 8/16/2017
Project ID: Former O'Neil's	Client: Wilcox	Location: 39° 25′ 35″ N, 86° 25′ 23″ W



B-49

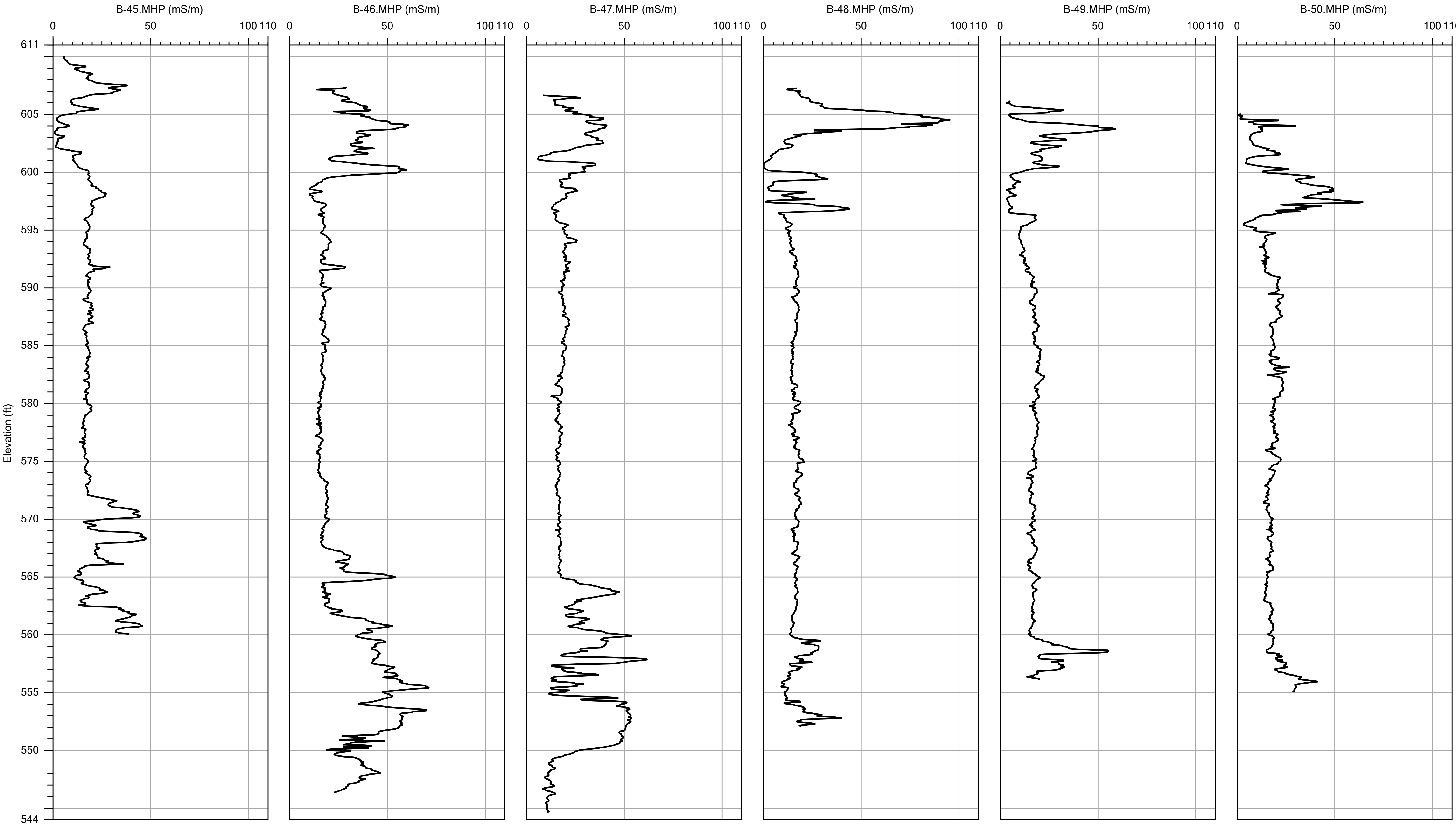
STOCK DRILLING
SAVE THE EARTH
Our Job is Boring!

		File: LLMIP - 05.MHP
Company: Stock Drilling Inc.	Operator: Ben L	Date: 8/16/2017
Project ID: Former O'Neil's	Client: Wilcox	Location: 39° 25′ 35″ N, 86° 25′ 25″ W



B-50

Company: Stock Drilling Inc.	Operator: Ben L	File: LLMIP - 06.MHP
		Date: 8/17/2017
Project ID: Former O'Neil's	Client: Wilcox	Location: 39° 25′ 34″ N, 86° 25′ 27″ W



Direct Image® By Geoprobe Systems®

EC

Company:	Stock Drilling Inc.	Operator:	Ben L
Project ID:	Former O'Neil's	Client:	Wilcox

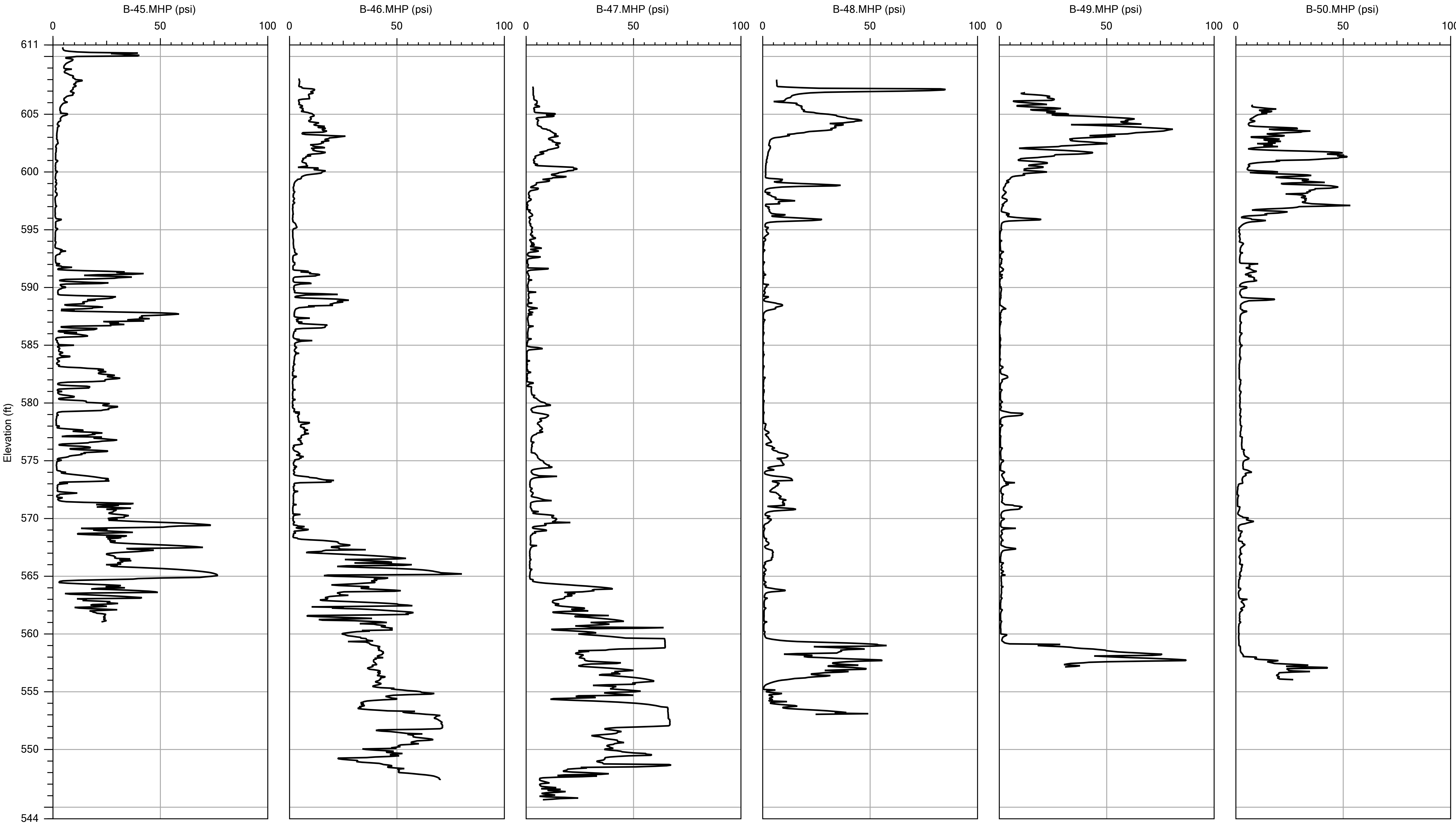
B-45.MHP 8/14/2017 39° 25′ 38″ N, 86° 25′ 10″ W	B-48.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 23″ W
B-46.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 13″ W	B-49.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 25″ W
B-47.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 16″ W	B-50.MHP 8/17/2017 39° 25′ 34″ N, 86° 25′ 27″ W

Direct Image® By Geoprobe Systems®

FID Max

Company: Stock Drilling Inc.	Operator: Ben L
Project ID: Former O'Neil's	Client: Wilcox

B-45.MHP 8/14/2017 39° 25′ 38″ N, 86° 25′ 10″ W	B-48.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 23″ W
B-46.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 13″ W	B-49.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 25″ W
B-47.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 16″ W	B-50.MHP 8/17/2017 39° 25′ 34″ N, 86° 25′ 27″ W

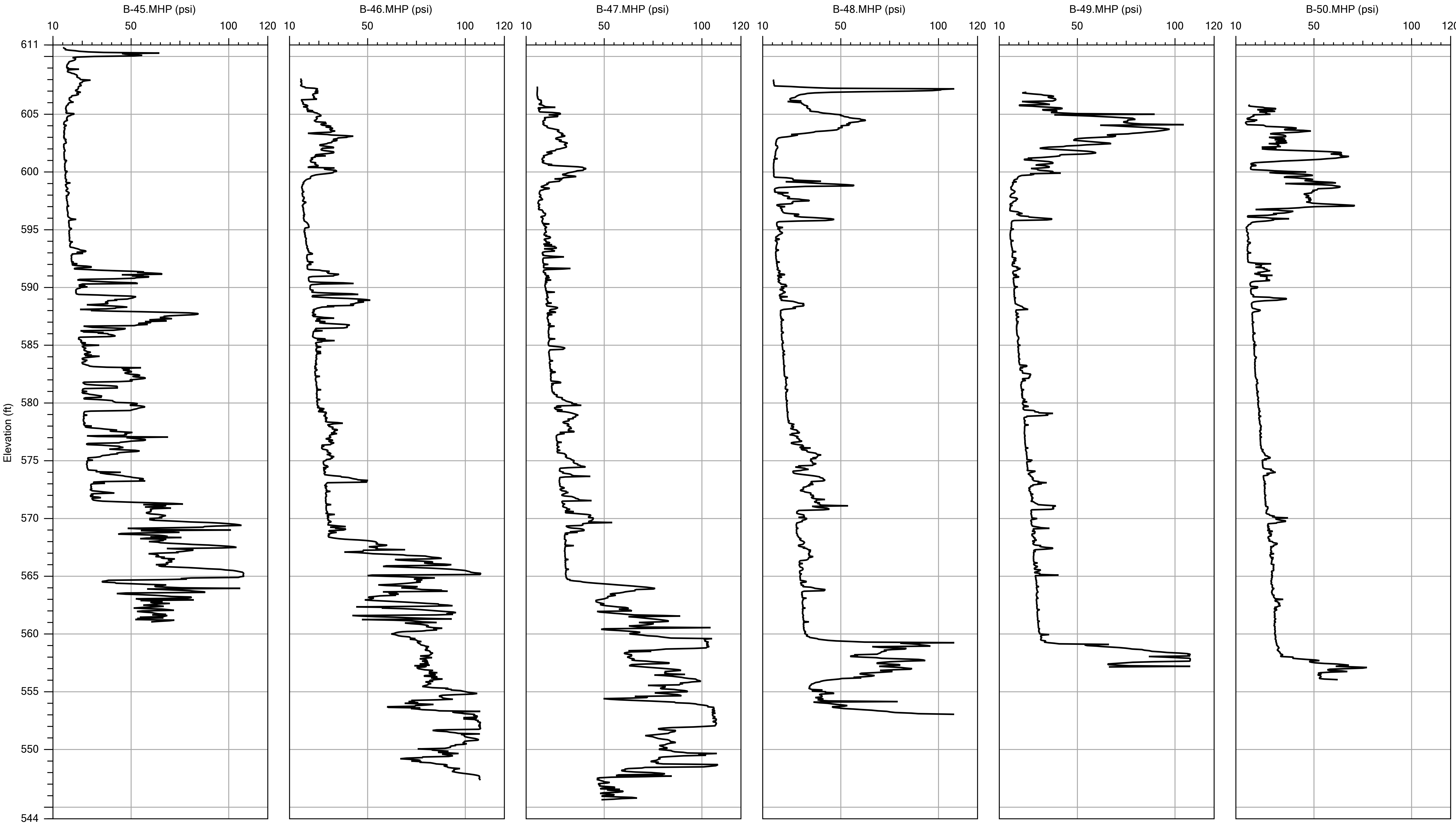


Direct Image® By Geoprobe Systems®

HPT Line Press. Avg

Company:	Stock Drilling Inc.	Operator:	Ben L
Project ID:	Former O'Neil's	Client:	Wilcox

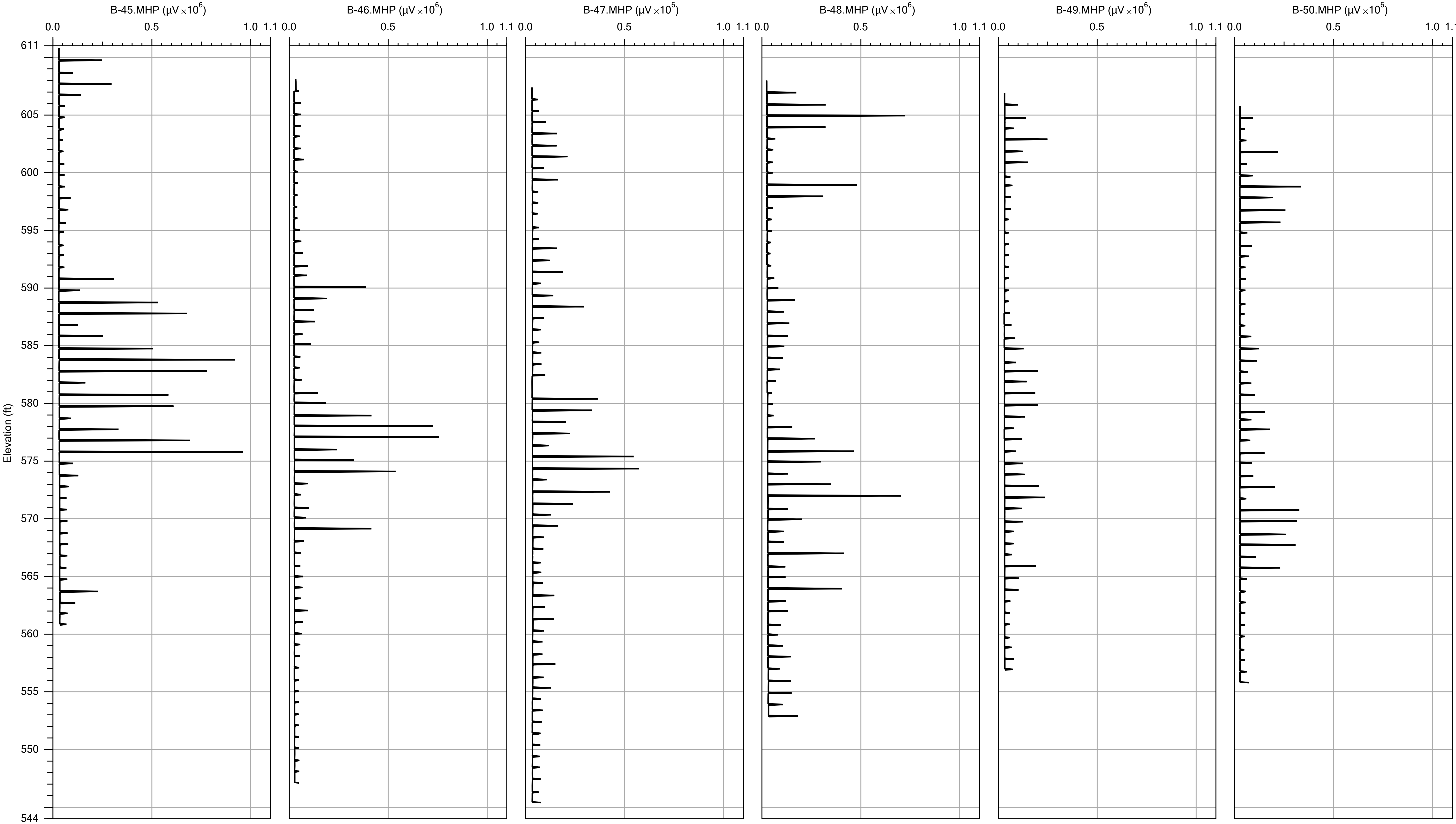
B-45.MHP 8/14/2017 39° 25′ 38″ N, 86° 25′ 10″ W	B-48.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 23″ W
B-46.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 13″ W	B-49.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 25″ W
B-47.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 16″ W	B-50.MHP 8/17/2017 39° 25′ 34″ N, 86° 25′ 27″ W



HPT Press. Max

Company:	Stock Drilling Inc.	Operator:	Ben L
Project ID:	Former O'Neil's	Client:	Wilcox

B-45.MHP 8/14/2017 39° 25′ 38″ N, 86° 25′ 10″ W	B-48.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 23″ W
B-46.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 13″ W	B-49.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 25″ W
B-47.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 16″ W	B-50.MHP 8/17/2017 39° 25′ 34″ N, 86° 25′ 27″ W

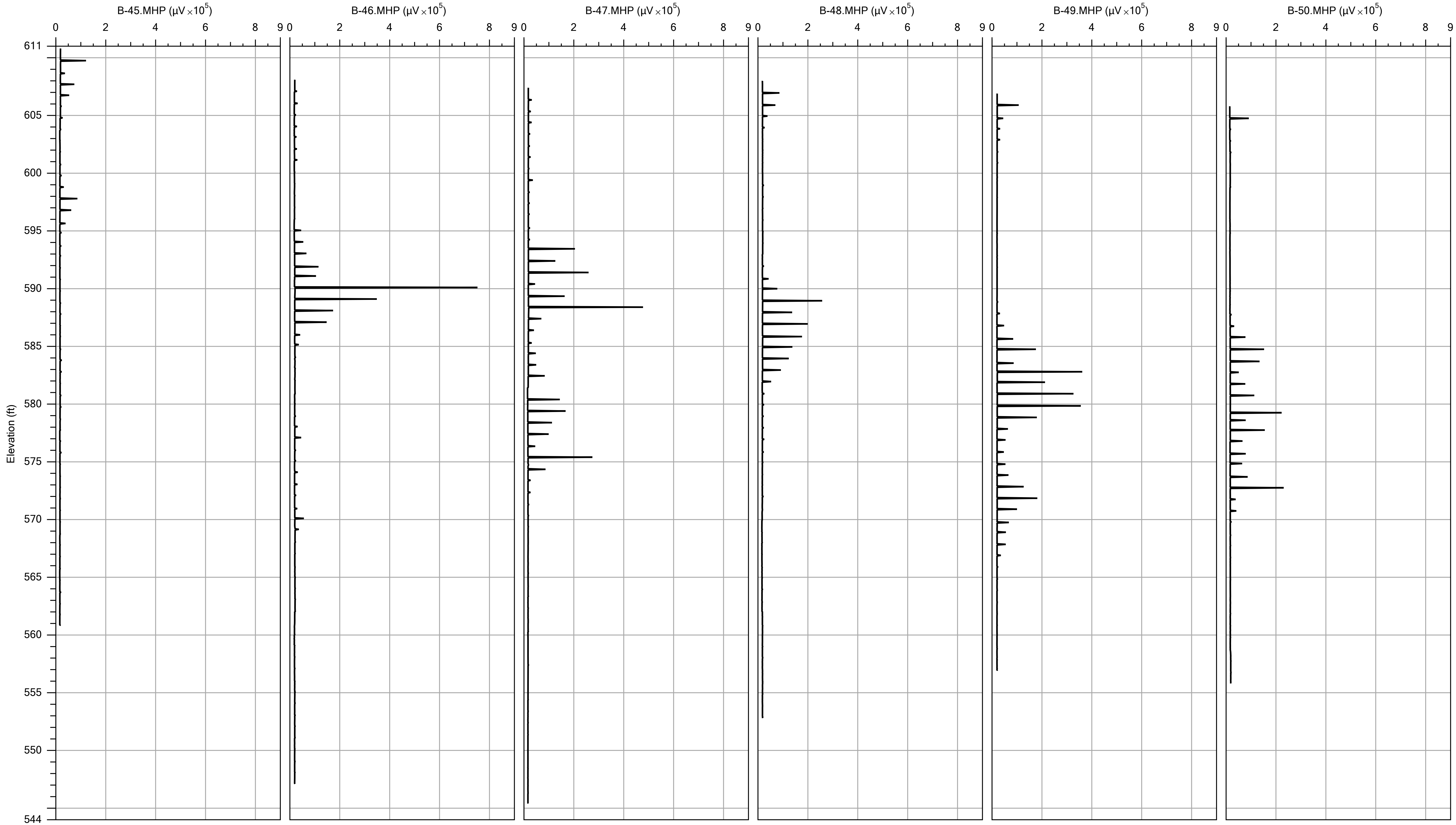


Direct Image® By Geoprobe Systems®

PID Max

Company:	Stock Drilling Inc.	Operator:	Ben L
Project ID:	Former O'Neil's	Client:	Wilcox

B-45.MHP 8/14/2017 39° 25′ 38″ N, 86° 25′ 10″ W	B-48.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 23″ W
B-46.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 13″ W	B-49.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 25″ W
B-47.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 16″ W	B-50.MHP 8/17/2017 39° 25′ 34″ N, 86° 25′ 27″ W



Direct Image
By Geoprobe Systems®

XSD Max

Company: Stock Drilling Inc.	Operator: Ben L
Project ID: Former O'Neil's	Client: Wilcox

B-45.MHP 8/14/2017 39° 25′ 38″ N, 86° 25′ 10″ W	B-48.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 23″ W
B-46.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 13″ W	B-49.MHP 8/16/2017 39° 25′ 35″ N, 86° 25′ 25″ W
B-47.MHP 8/15/2017 39° 25′ 37″ N, 86° 25′ 16″ W	B-50.MHP 8/17/2017 39° 25′ 34″ N, 86° 25′ 27″ W

APPENDIX D

Soil Boring Logs and Monitoring Well Construction Diagrams

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-4**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **C. Heckle/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **7.9'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **1/20/2015**	DATE COMPLETED: **1/20/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			ASPHALT SURFACE			
0–1.5	SW		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE), TRACE GRAVEL, VERY MOIST	50	0.0	
1.5–4.8	CL		DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY, TRACE GRAVEL, MOIST, MEDIUM	50	0.0	* 3.0-4.0' SAMPLE COLLECTED
4.8–7.9	SC		DARK YELLOWISH BROWN (10YR 4/6) CLAYEY SAND (COARSE), TRACE GRAVEL, VERY MOIST	70	0.0	
7.9	SW		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE), TRACE GRAVEL, WET	70	0.0	7.9'
8.5–10.8	SP-SM		PALE BROWN (10YR 6/3) POORLY GRADED SAND (FINE) WITH SILT, WET * 11.1' CLAY LENSE	70	0.0	
10.8–16	SW-SM		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET * 11.5' CLAY LENSE	70	0.0	
				70	0.0	
				80	0.0	
				80	0.0	

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: O'Neal's Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-5	
DRILLING CONTRACTOR: Midway Services	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: C. Heckle/C. Bonniwell
DRILLING EQUIPMENT: Geoprobe 5410	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 16.0'	DEPTH TO WATER: 9.0'
SAMPLING METHOD: Dual Tube	DATE STARTED: 1/20/2015	DATE COMPLETED: 1/20/2015

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			GRAVEL SURFACE			
1	GW		GRAY (10YR 7/1) WELL GRADED GRAVEL (COARSE) WITH SAND, MOIST	70	0.0	
1–4	CL		DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY, TRACE GRAVEL, MOIST, MEDIUM	70	0.0	* 3.0-5.0' SAMPLE COLLECTED
4–9.5	SC		DARK YELLOWISH BROWN (10YR 4/6) CLAYEY SAND (COARSE), MOIST	80 / 80 / 70	0.0 / 0.0 / 0.0	9.0'
9.5–10	CL		PALE BROWN (10YR 6/3) LEAN CLAY, MOIST, MEDIUM			
10–16	SW-SM		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET	70 / 80 / 80	0.0 / 0.0 / 0.0	

NOTES:

PROJECT:	WILCOX PROJECT #:	
O'Neal's Clothes Depot	**341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-6**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **C. Heckle/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410/CME-45**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **HSA**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.0'**
SAMPLING METHOD: **Dual Tube/HSA**	DATE STARTED: **3/18/15**	DATE COMPLETED: **3/18/15**

Depth (feet)	USCS	Description	% REC	PID	Well Construction
0		ASPHALT SURFACE			
0–1	SW-SC	DARK YELLOWISH BROWN (10YR 4/6), WELL GRADED SAND (COARSE) WITH CLAY, TRACE GRAVEL, MOIST	40	0.1	
1–4	CL	DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	40	0.1	* 2.0-4.0' SAMPLE COLLECTED
4–9	SC	DARK YELLOWISH BROWN (10YR 3/6), CLAYEY SAND (COARSE), TRACE GRAVEL, VERY MOIST * 8.0' WET	60	0.0	* 5.0-6.0' SAMPLE COLLECTED
			60	0.0	
9–9.7	CL	PALE BROWN (10YR 6/3), LEAN CLAY, WET, SOFT	60	0.1	
9.7–10	SC	DARK YELLOWISH BROWN (10YR 3/6), CLAYEY SAND (COARSE), TRACE GRAVEL, VERY MOIST			
10–11	SW-SC	PALE BROWN (10YR 6/3), WELL GRADED SAND (COARSE) WITH CLAY, TRACE GRAVEL, WET	60	0.1	
11–16	SP-SM	PALE BROWN (10YR 6/3), POORLY GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET	80	0.0	
			80	0.0	

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING	PROJECT: **O'Neal's Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-7**
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** — LOGGED BY/CHECK BY: **C. Heckle/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410/CME-45**	GROUND SURFACE ELEV.: **NA** — TOC ELEVATION: **NA**
	DRILLING METHOD: **HSA**	TOTAL DEPTH: **16.0'** — DEPTH TO WATER: **9.2'**
	SAMPLING METHOD: **Dual Tube/HSA**	DATE STARTED: **3/18/15** — DATE COMPLETED: **3/18/15**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0	GW		GRAVEL SURFACE			
	SW-SC		GRAY (10YR 7/1), WELL GRADED GRAVEL WITH SAND (COARSE), DRY, LOOSE			
1			PALE BROWN (10YR 6/3), WELL GRADED SAND (COARSE) WITH CLAY, TRACE GRAVEL, MOIST	50	0.0	
			DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM			
2						
3	CL			50	0.1	
						* 3.0-4.0' SAMPLE COLLECTED
4						
5				50	0.0	
			BROWN (10YR 4/3), CLAYEY SAND (COARSE), TRACE GRAVEL, MOIST			
6						
						* 6.0-7.0' SAMPLE COLLECTED
7	SC			50	0.0	
8						
			PALE BROWN (10YR 6/3), POORLY GRADED SAND (COARSE), WITH SILT, TRACE GRAVEL			
9			* 9.2' WET	70	0.1	
10						
11				70	0.2	
			* 11.5' CLAY LENS			
12	SP-SM					
13				80	0.1	
14						
15				8	0.1	
16						

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: O'Neal's Clothes Depot	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-8	
DRILLING CONTRACTOR: Midway Services, Inc.	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: C. Heckle/C. Bonniwell
DRILLING EQUIPMENT: Geoprobe 5410/CME-45	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: HSA	TOTAL DEPTH: 16.0'	DEPTH TO WATER: 9.1'
SAMPLING METHOD: Dual Tube/HSA	DATE STARTED: 3/18/15	DATE COMPLETED: 3/18/15

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			ASPHALT SURFACE			
0–4.5	CL		DARK YELLOWISH BROWN (10YR 4/6), LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM * 1.4' LARGE GRAVEL			
1				40	0.7	* 1.0-2.0' SAMPLE COLLECTED
3				40	0.0	* 3.0-5.0' SAMPLE COLLECTED
4.5–8.5	SC		BROWN (10YR 4/3), CLAYEY SAND (FINE), TRACE GRAVEL, MOIST			
5				70	0.0	
7				70	0.0	
8.5–16	SP-SM		BROWN (10YR 5/3), POORLY GRADED SAND (COARSE) WITH SILT * 9.1' WET * 10.6' SILT LENS			
9				60	0.0	
11				60	0.0	
13				70	0.0	
15				70	0.0	
16						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-9**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **11.2'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/25/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			GRASS SURFACE			
0-4	ML		DARK BROWN (10YR 3/3), SILT WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	60	0.0	
				60	0.0	
4-6.2	CL		YELLOWISH BROWN (10YR 5/6), LEAN CLAY WITH SAND, MOIST, MEDIUM	80	0.0	* 5.0-6.0' SAMPLE COLLECTED
6.2-8	SC		YELLOWISH BROWN (10YR 5/6), CLAYEY SAND, MOIST, MEDIUM DENSE	80	0.0	
8-9.5	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE	50	0.0	
9.5-11.2	SC		BROWN (10YR 4/3), CLAYEY SAND, MOIST, MEDIUM DENSE	50	0.0	
11.2-16	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND (COARSE), WET, LOOSE	50	0.7	
				50	0.1	
16						

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-10**

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **10.8'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/25/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			GRASS SURFACE			
0-6	ML		DARK BROWN (10YR 3/3), SILT WITH SAND, MOIST, MEDIUM			
1				80	0.0	
3				80	0.0	
3.7			* 3.7' COLOR CHANGE YELLOWISH BROWN (10YR 5/6)			
5				70	0.0	
5.5						* 5.0-6.0' SAMPLE COLLECTED
6-16	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE			
7				70	0.0	
9				70	0.0	
10.8			* 10.8' WET			
11				70	0.0	
12			* 12.0' COLOR CHANGE PALE BROWN (10YR 6/3), COARSE SAND			
13				80	0.5	
15				80	0.2	
16						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-11**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **11.0'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/25/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			ASPHALT SURFACE			
	ML		BROWN (10YR 4/3), SILT WITH SAND, MOIST, MEDIUM			
1				80	0.0	
3				80	0.0	
5				60	0.0	
						* 5.0-6.0' SAMPLE COLLECTED
7			* 6.8' COLOR CHANGE YELLOWISH BROWN (10YR 5/6)	60	0.0	
8	SP		YELLOWSH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE			
9				50	0.0	
11			* 11.0' COLOR CHANGE PALE BROWN (10YR 6/3), COARSE SAND, WET	50	0.0	
13				50	0.0	
15				50	0.0	
16						

NOTES:

PROJECT:	WILCOX PROJECT #:	
Clothes Depot	**341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-12**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **13.6'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015**	DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
0–2.5	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	50	0.0	
2.5–7.5	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	50	0.0	
				50	0.0	
				50	0.0	
				50	0.0	
7.5–16	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, MEDIUM	50	0.0	
				50	0.0	
				50	0.0	
				50	0.0	

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-13**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **13.2'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015**	DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
0–2	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	40	0.0	
2–8	CL		DARK BROWN (10YR 3/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
8–16	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, MEDIUM DENSE * 13.2' WET			

Depth interval (feet)	% REC	PID
0–2	40	0.0
2–4	40	0.0
4–6	60	0.0
6–8	60	0.0
8–10	60	0.0
10–12	60	0.0
12–14	60	0.0
14–16	60	0.0

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-14**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.1'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015**	DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–1	SW		PALE BROWN (10YR 6/3), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	20	0.0	
1–4	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	20	0.0	
4–16	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE	70	0.0	
				70	0.0	
				70	0.0	
				70	0.1	
			* 12.1' VERY COARSE SAND, WET	60	0.0	
				60	0.0	

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-15**
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** / LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA** / TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'** / DEPTH TO WATER: **11.2'**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015** / DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–8	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM * 3.3' PALE BROWN (10YR 6/3)			
0–2				80	0.9	
2–4				80	0.2	
4–6				70	0.1	
6–8				70	0.1	
8–12	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE * 11.2' WET			
8–10				60	0.3	
10–12				60	0.1	
12–16	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, WET, COARSE			
12–14				60	0.2	
14–16				60	0.1	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-16**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **11.7'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015**	DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–4	SW		BROWN (10YR 5/3), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1				5	0.0	
3				5	0.0	
4–7	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
5				50	0.0	
7–16	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE			
7				50	0.0	
9				60	0.0	
11				60	0.0	
11.7			* 11.7' WET			
12			* 12.0' VERY COARSE SAND			
13				70	0.0	
15				70	0.0	
16–20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-17**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.2'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015**	DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1			BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	60	0.0	
2						
3	CL			60	0.0	
4						
			BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE			
5				50	0.0	
6						
7				50	0.0	
8			* 8.4' PALE BROWN (10YR 6/3)			
9				50	15	
10	SP					
11				50	1.0	
12			* 12.0' VERY COARSE SAND * 12.2' WET			
13				60	0.1	
14						
15				60	0.0	
16						
17						
18						
19						
20						

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-18**

WILCOX ENVIRONMENTAL ENGINEERING — AIR | LAND | WATER

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **11.8'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015**	DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–4.5	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM * 3.1' INCREASED SAND			
1				50	0.0	
3				50	0.0	
4.5–9.5	SP		YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, MEDIUM			
5				30	0.0	
7				30	0.0	
9				50	0.1	
9.5–10	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
10–16	SP		YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, MEDIUM * 11.8' WET			
11				50	0.6	
13				70	1.0	
15				70	0.0	
16–20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-19**
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** — LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA** — TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'** — DEPTH TO WATER: **13.8'**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/14/2015** — DATE COMPLETED: **12/14/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
0–4	SW		BLACK (10YR 2/1) AND DARK YELLOWISH BROWN (10YR 3/4), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	50	0.5	
				50	0.1	
4–6.5	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	70	0.0	
6.5–16	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE	70	0.0	
				60	0.0	
				60	0.0	
12			* 12.1' PALE BROWN (10YR 6/3), VERY COARSE SAND	60	0.0	
14			* 13.8' WET	60	0.0	
16–20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-20**
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** — LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA** — TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'** — DEPTH TO WATER: **12.3'**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015** — DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRAVEL SURFACE			
0–1	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	70	0.0	
1–6	SP-SC		DARK YELLOWISH BROWN (10YR 4/6), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM	70	0.0	
				60	0.0	
6	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
6–11.5	SP-SC		DARK YELLOWISH BROWN (10YR 4/6), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM	60	0.1	
				60	0.2	
				60	0.1	
11.5	CL		BROWN (10YR 5/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
12–16	SP-SC		DARK YELLOWISH BROWN (10YR 4/6), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM * 12.3' PALE BROWN (10YR 6/3), WET	90	0.1	
				90	0.0	
16–20						

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-21**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–1.5	SW		YELLOWISH BROWN (10YR 5/4), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	10	0.0	
1.5–8	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	10	0.0	
				20	0.0	
			* 7.1' INCREASE IN SAND CONTENT	20	0.0	
8–16	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE	10	0.0	
				10	0.0	
			* 12.0' PALE BROWN (10YR 6/3), VERY COARSE SAND, WET	70	0.0	
				70	0.0	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-22**

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **11.5'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0.2–6	CL		DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, TRACE ORGANICS, MOIST, MEDIUM			
0–2				40	0.0	
2–4				40	0.0	
4–6				50	0.0	
6–16	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE			
6–8				50	0.0	
8–10				60	0.0	
10–12			* 10.7' PALE BROWN (10YR 6/3) * 11.5' WET	60	0.0	
12–14				70	0.0	
14–16			* 14.2' VERY COARSE SAND	70	0.0	

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-23**	
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.0'**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
	SW		GRAYISH BROWN (10YR 5/2), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	20	0.0	
2						
3				20	0.0	
4						
5				70	0.0	
6						
7	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE	70	0.0	
8						
9				70	0.1	
10						
11				70	0.2	
12			* 11.5' PALE BROWN (10YR 6/3) * 12.0' WET			
13				90	0.0	
14						
15				90	0.0	
16						
17						
18						
19						
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-24**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0-1	SW		GRAY (10YR 5/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	5	0.0	
1-4	CL		BROWN (10YR 5/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	5 / 5	0.0 / 0.0	
4-16	-		4.0-16.0' NO RECOVERY	-	-	

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-25**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.3'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–0.4	SW		YELLOWISH BROWN (10YR 5/4), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
0.4–5.5	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
5.5–7.3	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE			
7.3–11.6	CL		DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
11.6–16	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND (VERY COARSE), MOIST, LOOSE * 12.3' WET			

Sample Interval (feet)	% REC	PID
0–2	20	0.3
2–4	20	1.0
4–6	50	0.5
6–8	50	0.2
8–10	70	0.9
10–12	70	0.3
12–14	80	0.0
14–16	80	0.0

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING — AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-26**	
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.6'**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		GRAVEL SURFACE			
0–1.5	SW	BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	50	0.0	
1.5–5	CL	DARK BROWN (10YR 3/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	50	0.1	
			80	0.1	
5–10.8	SW-SC	DARK YELLOWISH BROWN (10YR 4/4), WELL GRADED SAND WITH SOME CLAY, MOIST, MEDIUM DENSE	80	0.1	
			60	0.1	
10.8–16	SP	PALE BROWN (10YR 6/3), POORLY GRADED SAND (VERY COARSE), MOIST, LOOSE * 12.6' WET	60	0.0	
			70	0.2	
			70	0.3	

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-27**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **11.2'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–4	CL		DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
1				20	0.0	
3				20	0.0	
4–4.5	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE			
4.5–7.5	CL		DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
5				50	0.0	
7				50	0.0	
7.5–16	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE			
9				60	0.0	
11			* 11.2' SAND (VERY COARSE), WET * 11.3' PALE BROWN (10YR 6/3)	60	0.0	
13				70	0.0	
15				70	0.0	

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-28**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.2'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1	CL		DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	50	0.0	
2						
3	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE	50	0.0	
4						
5				60	0.0	
6						
7				60	0.0	
8						
9				70	0.6	
10			* 10.4' SAND (VERY COARSE)			
11				70	0.2	
12			* 12.2' WET			
13				70	0.6	
14						
15				70	0.4	
16						
17						
18						
19						
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-29**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.4'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRAVEL SURFACE			
0–2	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	50	0.0	
2–6	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM * 4.0' GRAYISH BROWN (10YR 5/2)	50 40	0.0 0.0	
6–16	SP		YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, LOOSE * 9.0' INCREASE IN CLAY CONTENT * 12.4' WET	40 70 70 50 50	0.2 0.1 0.0 0.8 0.7	

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-30**

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **12.2'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0–2	-		0.0-4.0' NO RECOVERY	0	-	
2–4				0	-	
4–6	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	50	0.0	
6–8				50	0.0	
8–10	SP		YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, LOOSE	30	0.0	
10–12			* 11.3' PALE BROWN (10YR 6/3), SAND (VERY COARSE)	30	0.0	
12–14			* 12.2' WET	50	0.0	
14–16				50	0.0	
16–20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**		
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-31**		
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**	
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**	
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.8'**	
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**	

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
0–1	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	30	2.1	
1–8	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
2–3				30	3.0	
4–5				50	2.4	
6–7				50	2.5	
8–9	SP		BROWN (10YR 4/3), POORLY GRADED SAND (VERY FINE), MOIST, LOOSE	70	2.6	
9–10	CL		PALE BROWN (10YR 6/3), LEAN CLAY WITH SAND, MOIST, STIFF			
10–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE	70	2.7	
12–13				80	1.0	
14–15				80	0.2	
16			* 15.8' WET * 16.1' SAND (VERY FINE)			
16–17				70	0.0	
18–19				70	0.0	
20						

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-32**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **17.1'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		GRASS SURFACE			
0–4	SP-SC	BROWN (10YR 4/3), POORLY GRADED SAND WITH CLAY, MOIST, LOOSE			
1			40	0.1	
3			40	0.0	
4–12	SP	YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, LOOSE			
5			60	0.3	
7			60	0.0	
9			60	0.0	
11			60	0.0	
12–13	CL	LIGHT BROWNISH GRAY (10YR 6/2), LEAN CLAY WITH SAND, MOIST, MEDIUM			
13–20	SP	PALE BROWN (10YR 6/3), POORLY GRADED SAND (VERY COARSE), MOIST, LOOSE			
13			80	0.0	
15			80	0.0	
17		* 17.1' WET	80	0.3	
19			80	0.3	
20					

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-33**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **16.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1			BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	30	0.0	
2						
3				30	0.0	
4	CL					
5				40	0.0	
6			BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE			
7				40	0.0	
8						
9				60	0.0	
10						
11				60	0.0	
12			* 11.8' PALE BROWN (10YR 6/3), SAND (VERY COARSE)			
13	SP			70	0.0	
14						
15				70	0.0	
16			* 16.0' WET			
17				70	0.0	
18						
19				70	0.0	
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-34**	
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **16.0'**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
0–2	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	80	0.6	
2–4	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	80	0.4	
4–6	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE	70	0.3	
6–8	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	70	0.2	
8–10	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE	70	0.1	
10–12	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	70	0.1	
	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE			
12–14			* 12.0' PALE BROWN (10YR 6/3)	70	0.0	
14–16				70	0.0	
16–18			* 16.0' WET	80	0.0	
18–20				80	0.0	

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-35**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **13.3'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–4	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, SOME ORGANICS, MOIST, MEDIUM			
1				60	0.0	
3				60	0.0	
4–16	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE			
5				60	0.0	
7				60	0.0	
9				70	0.8	
11				70	0.8	
13			*13.3' WET	80	0.1	
15				80	0.0	
16–20						

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-36**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.5'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/15/2015**	DATE COMPLETED: **12/15/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–4.5	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
4.5–8.1	SP		BROWN (10YR 4/3), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM DENSE			
8.1–10.6	CL		PALE BROWN (10YR 6/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
10.6–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE * 15.5' WET * 16.2' SAND (VERY COARSE)			

Depth interval (feet)	% REC	PID
0–2	40	0.0
2–4	40	0.0
4–6	50	0.0
6–8	50	0.0
8–10	50	0.0
10–12	50	0.0
12–14	70	0.0
14–16	70	0.0
16–18	80	0.0
18–20	80	0.0

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-34**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **16.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
0–2	SW		BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	80	0.6	
2–4.8	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	80	0.4	
4.8–7.2	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE	70	0.3	
				70	0.2	
7.2–7.7	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
7.7–10.2	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE	70	0.1	
10.2–10.4	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
10.4–20	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE	70	0.1	
			* 12.0' PALE BROWN (10YR 6/3)	70	0.0	
				70	0.0	
			* 16.0' WET	80	0.0	
20				80	0.0	

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-35**

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **13.3'**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–4	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, SOME ORGANICS, MOIST, MEDIUM			
4–16	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE *13.3' WET			

Depth interval (feet)	% REC	PID
0–2	60	0.0
2–4	60	0.0
4–6	60	0.0
6–8	60	0.0
8–10	70	0.8
10–12	70	0.8
12–14	80	0.1
14–16	80	0.0

NOTES:

PROJECT: Clothes Depot	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-36	
DRILLING CONTRACTOR: Midway Services, Inc.	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: Z. Wojcik/C. Bonniwell
DRILLING EQUIPMENT: Geoprobe 5410	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 20.0'	DEPTH TO WATER: 15.5'
SAMPLING METHOD: NA	DATE STARTED: 12/15/2015	DATE COMPLETED: 12/15/2015

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–4.3	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	40 (0–2), 40 (2–4)	0.0, 0.0	
4.3–8.2	SP		BROWN (10YR 4/3), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM DENSE	50 (4–6), 50 (6–8)	0.0, 0.0	
8.2–10.7	CL		PALE BROWN (10YR 6/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	50 (8–10)	0.0	
10.7–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE * 15.5' WET * 16.2' SAND (VERY COARSE)	50 (10–12), 70 (12–14), 70 (14–16), 80 (16–18), 80 (18–20)	0.0, 0.0, 0.0, 0.0, 0.0	

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-37**
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** — LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA** — TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'** — DEPTH TO WATER: **15.6'**
SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016** — DATE COMPLETED: **1/7/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–8	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM * 4.2' BROWN (10YR 4/2)			
0–2				50	0.0	
2–4				50	0.0	
4–6				60	0.0	
6–8				60	0.0	
8–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE * 11.5' COARSE SAND * 15.6' WET			
8–10				80	0.0	
10–12				80	0.0	
12–14				70	0.0	
14–16				70	0.0	
16–18				50	0.0	
18–20				50	0.0	

NOTES:

PROJECT:	WILCOX PROJECT #:	
Clothes Depot	**341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-38**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.7'**
SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016**	DATE COMPLETED: **1/7/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–4	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
4–4.5	SW		YELLOWISH BROWN (10YR 5/4), WELL GRADED SAND, MOIST, LOOSE			
4.5–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE			
15.7			* 15.7' WET			
1				50	0.0	
3				50	0.0	
5				50	0.0	
7				50	0.0	
9				60	0.0	
11				60	0.0	
13				50	0.0	
15				50	0.0	
17				60	0.0	
19				60	0.0	

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-39**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.8'**
SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016**	DATE COMPLETED: **1/7/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–6	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, ORGANICS, TRACE DEBRIS (BRICK), MOIST, MEDIUM			
0–2				70	0.0	
2–4				70	0.0	
4–6				80	0.0	
6–20	SW		YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, LOOSE * 7.0' PALE BROWN (10YR 3/2) * 15.8' WET * 16.0' VERY COARSE SAND			
6–8				80	0.0	
8–10				60	0.0	
10–12				60	0.0	
12–14				80	0.0	
14–16				80	0.0	
16–18				60	0.0	
18–20				60	0.0	

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-40**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.5'**
SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016**	DATE COMPLETED: **1/7/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRAVEL SURFACE			
	SW		GRAY (10YR 5/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1	CL		DARK GRAYISH BROWN (10YR 4/2), LEAN CLAY WITH SAND, SOME GRAVEL, MOIST, MEDIUM	50	0.0	
2						
3				50	0.0	
4			* 4.1' PALE BROWN (10YR 3/2)			
5				40	0.0	
6						
7				40	0.0	
8	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE			
9				50	0.0	
10						
11				50	0.0	
12						
13				70	0.0	
14						
15			* 15.5' WET	70	0.0	
16			* 16.1' VERY COARSE SAND			
17				70	0.0	
18						
19				70	0.0	
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**		
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-41**		
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**	
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**	
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.7'**	
SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016**	DATE COMPLETED: **1/7/2016**	

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRAVEL SURFACE			
1	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	60	0.0	
2						
3				60	0.0	
4			* 4.2' YELLOWISH BROWN (10YR 5/4)			
5				60	0.0	
6						
7				60	0.0	
8						
9				60	0.0	
10	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MIOST, LOOSE			
11				60	0.0	
12						
13				70	0.0	
14						
15				70	0.0	
16			* 15.7' WET			
17				60	0.0	
18						
19				60	0.0	
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-42**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **16.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016**	DATE COMPLETED: **1/7/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0.4–10	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
10–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MIOST, LOOSE * 16.0' WET * 16.2' VERY COARSE SAND			

Depth interval (feet)	% REC	PID
0–2	50	0.0
2–4	50	0.0
4–6	40	0.0
6–8	40	0.0
8–10	60	0.0
10–12	60	0.0
12–14	80	0.0
14–16	80	0.0
16–18	70	0.0
18–20	70	0.0

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-43**
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**
		LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
	DRILLING EQUIPMENT: **Geoprobe 5410**	GROUND SURFACE ELEV.: **NA**
		TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**
		DEPTH TO WATER: **16.0'**
	SAMPLING METHOD: **NA**	DATE STARTED: **1/7/2016**
		DATE COMPLETED: **1/7/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0.4–7	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
7–8	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE			
8–9.5	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM			
9.5–12	SP		BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE			
12–16	-		NO RECOVERY			
16–20	SP		PALE BROWN (10YR 6/3), POORLY GRADED SAND, WET, LOOSE			

Interval (feet)	% REC	PID
0–2	20	0.0
2–4	20	0.0
4–6	90	0.0
6–8	90	0.0
8–10	50	0.0
10–12	50	0.0
12–14	0	-
14–16	0	-
16–18	5	0.0
18–20	5	0.0

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: Clothes Depot	WILCOX PROJECT #: 341.14
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-44
DRILLING CONTRACTOR: Midway Services, Inc.	DRILLER/LICENSE #: J. Toddish/#1946WD — LOGGED BY/CHECK BY: Z. Wojcik/ J. Kinman
DRILLING EQUIPMENT: Geoprobe 5410	GROUND SURFACE ELEV.: NA — TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 20.0' — DEPTH TO WATER: 16.0'
SAMPLING METHOD: NA	DATE STARTED: 1/7/2016 — DATE COMPLETED: 1/7/2016

Depth (feet)	USCS	Description	% REC	PID	Notes
0		GRASS SURFACE			
0–7	CL	BROWN (10YR 4/3), LEAN CLAY WITH SAND, TRACE DEBRIS (BRICK), MOIST, MEDIUM			
1			50	0.0	
3			50	0.0	
5			50	0.0	
7–8.1	SP	BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, LOOSE	50	0.0	
8.1–12	CL	YELLOWISH BROWN (10YR 5/6), LEAN CLAY WITH SAND, MOIST, MEDIUM			
9			60	0.0	
11			60	0.0	
12–20	SP	PALE BROWN (10YR 6/3), POORLY GADED SAND, MOIST LOOSE			
13			80	0.0	
15			80	0.0	
16		* 16.0' WET			
17			70	0.0	
19			70	0.0	
20					

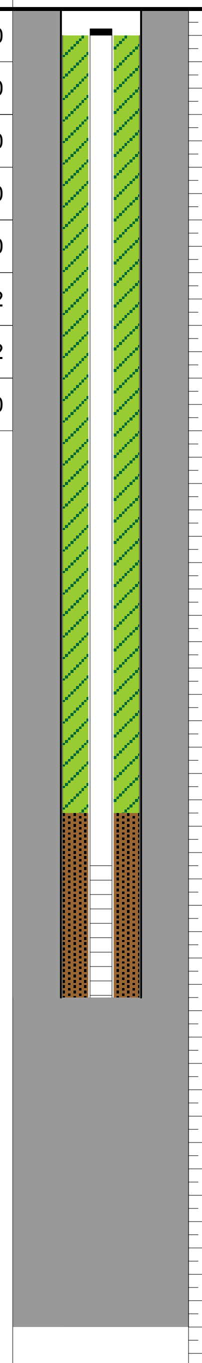
NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-45/MW-09D**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **MIP**	TOTAL DEPTH: **50.0'**	DEPTH TO WATER: **10.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **8/14/2017**	DATE COMPLETED: **8/15/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID
0			ASPHALT SURFACE		
0–2			SOIL CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING MW-9. REFER TO BORING LOG MW-9 FOR COMPLETE SOIL DESCRIPTION.	50	0.0
2–4				50	0.0
4–6				30	0.0
6–8				30	0.0
8–10				40	0.0
10–12				40	1.2
12–14				50	0.2
14–16				50	0.0

Well Construction



Flush mounted 10" cover
0.75-32.5' 2 in dia., sch. 40 PVC riser
1.0-30.5' Bentonite Seal
*4.0'-6.0' SAMPLE COLLECTED
30.5-37.5' #4 Quartz Sand Pack
32.5-37.5' 2 in dia., 0.010" slot, sch. 40 PVC well screen
Drilling terminated at 50.0' bgs

NOTES:

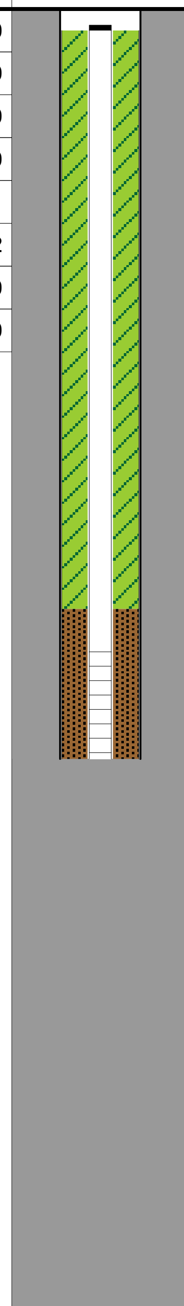
PROJECT: Former O'Neals Clothes Depot Cleaners	WILCOX PROJECT #: 341.14
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-46/MW-15D

DRILLING CONTRACTOR: Stock Drilling	DRILLER/LICENSE #: Ernie Phylor #4111WD	LOGGED BY/CHECK BY: J. Kinman/O. Purcell
DRILLING EQUIPMENT: Geoprobe 7330DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: MIP	TOTAL DEPTH: 61.0'	DEPTH TO WATER: 9.0'
SAMPLING METHOD: NA	DATE STARTED: 8/15/2017	DATE COMPLETED: 8/15/2017

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

Depth (feet)	USCS	Graphic Log	Description	% REC	PID
0			CONCRETE SURFACE		
1				20	0.0
2–8			SOIL CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-23. REFER TO BORING LOG B-23 FOR COMPLETE SOIL DESCRIPTION. *6.0'-8.0' SOIL SAMPLE COLLECTED	20	0.0
				70	0.0
				70	0.0
				70	0.1
				70	0.2
				90	0.0
				90	0.0

Well Construction



Flush mounted 10" cover
0.75-30.0' 2 in dia., sch. 40 PVC riser
1.0-28.0' Bentonite Seal
28.0-35.0' #4 Quartz Sand Pack
30.0-35.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
Drilling terminated at 61.0' bgs

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-47**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **MIP**	TOTAL DEPTH: **63.0'**	DEPTH TO WATER: **9.5'**
SAMPLING METHOD: **NA**	DATE STARTED: **8/15/2017**	DATE COMPLETED: **8/15/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
			SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING MW-26. REFER TO BORING LOG MW-26 FOR COMPLETE SOIL DESCRIPTION.			

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: Former O'Neals Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-48	
DRILLING CONTRACTOR: Stock Drilling	DRILLER/LICENSE #: Ernie Phylor #4111WD	LOGGED BY/CHECK BY: J. Kinman/O. Purcell
DRILLING EQUIPMENT: Geoprobe 7330DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: MIP	TOTAL DEPTH: 55.0'	DEPTH TO WATER: 12.0'
SAMPLING METHOD: NA	DATE STARTED: 8/16/2017	DATE COMPLETED: 8/16/2017

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			ASPHALT SURFACE			
1–56			SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING MW-24. REFER TO BORING LOG MW-24 FOR COMPLETE SOIL DESCRIPTION.			

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-49**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **MIP**	TOTAL DEPTH: **50.0'**	DEPTH TO WATER: **12.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **8/16/2017**	DATE COMPLETED: **8/16/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
1–50			SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-39. REFER TO BORING LOG B-39 FOR COMPLETE SOIL DESCRIPTION.			

Depth scale: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-50**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **MIP**	TOTAL DEPTH: **50.0'**	DEPTH TO WATER: **12.0'**
SAMPLING METHOD: **NA**	DATE STARTED: **8/17/2017**	DATE COMPLETED: **8/17/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRAVEL SURFACE			
1–52			SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-4/MW-20. REFER TO BORING LOG B-4/MW-20 FOR COMPLETE SOIL DESCRIPTION.			

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**		
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-51**		
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**	
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**	
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **13.5'**	
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/17/2017**	DATE COMPLETED: **8/17/2017**	

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
1	SM		VERY DARK GRAYISH BROWN (10YR 3/2), SILTY SAND WITH GRAVEL, DRY	60	0.3	
2						
3				60	0.1	
4						
5	SW		LIGHT YELLOWISH BROWN (10YR 6/4), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	60	0.1	
6						
7				60	0.2	
8						
9				100	0.2	
10			*10.0' INCREASED MOISTURE CONTENT			
11				100	1.0	
12						*12.0'-17.0 GRAB GROUNDWATER SAMPLE COLLECTED
13				100	1.7	
14			*13.5' WET			
15				100	0.2	
16			*16.3'-17.2' INCREASED SILT CONTENT			
17				100	0.1	
18			*17.7' COLOR CHANGE TO DARK BROWN (10YR 3/3)			
19				100	0.0	
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-52**
	DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD** — LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
	DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA** — TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'** — DEPTH TO WATER: **13.7'**
	SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/17/2017** — DATE COMPLETED: **8/17/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
1	SM		BROWN (10YR 4/3), SILTY SAND WITH GRAVEL, DRY	80	0.0	
3	SM			80	0.0	
5	SM			100	0.0	
7	SM			100	0.0	
9	SM			100	0.1	
11	SM		*10.8' INCREASED MOISTURE CONTENT *11.0' DECREASED SILT CONTENT	100	0.0	
12	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND WITH GRAVEL, MOIST, MEDIUM DENSE			
13	SW		*13.7' WET	100	0.3	
15	SW			100	0.0	
17	SW			100	0.0	
19	SW			100	0.4	*20.0 GRAB GROUNDWATER SAMPLE COLLECTED
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-53**

DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **12.7'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/17/2017**	DATE COMPLETED: **8/17/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0.5–12	SM		VERY DARK BROWN (10YR 2/2), SILTY SAND WITH GRAVEL, DRY, MEDIUM DENSE *0.7'-2.3' COLOR CHANGE TO BLACK (10YR 2/1) *11.2' INCREASED MOISTURE CONTENT			
12–20	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE *12.7' WET			*14.0 GRAB GROUNDWATER SAMPLE COLLECTED

Depth (feet)	% REC	PID
0–2	70	0.0
2–4	70	0.1
4–6	100	0.1
6–8	100	0.0
8–10	70	0.0
10–12	70	0.0
12–14	60	0.3
14–16	60	0.0
16–18	70	0.0
18–20	70	0.0

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-54**
	DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**
		LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
	DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**
		TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**
		DEPTH TO WATER: **15.2'**
	SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/18/2017**
		DATE COMPLETED: **8/18/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
1	SC		VERY DARK BROWN (10YR 2/2), CLAYEY SAND, LOW PLASTICITY, MOIST, MEDIUM DENSE	70	0.2	
2						
3				70	0.0	
4						
5	SP		BROWN (10YR 5/3), POORLY GRADED SAND WITH GRAVEL, MOIST, MEDIUM DENSE	80	0.0	
6						
7				80	0.1	
8						
9				80	0.1	
10						
11			*17.8' GRAVEL CONTENT DECREASES	80	0.1	
12						
13				60	0.0	
14						
15	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND WITH GRAVEL, WET, LOOSE *15.2' WET	60	0.0	
16						
17				70	0.0	
18						
19				70	0.0	
20						*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

	PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-55**

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.8'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/18/2017**	DATE COMPLETED: **8/18/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
1	SC		VERY DARK BROWN (10YR 2/2), CLAYEY SAND, LOW PLASTICITY, MOIST, MEDIUM DENSE	60	0.4	
3				60	0.1	
3.7			*3.7' COLOR CHANGE TO BROWN (10YR 4/3)			
5				70	0.1	
7	SP		BROWN (10YR 5/3), POORLY GRADED SAND WITH GRAVEL (FINE), MOIST, MEDIUM	70	0.6	
9				70	0.4	
11				70	0.2	
13				70	0.2	
15				70	0.1	
15.8			*15.8' WET			
17	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND (FINE TO COARSE), WET, LOOSE	100	0.2	
19				100	0.1	
20						*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-56**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **12.6'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/18/2017**	DATE COMPLETED: **8/18/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
0.5–4.7	SC		VERY DARK GRAY (10YR 3/1), CLAYEY SAND, LOW PLASTICITY, MOIST, MEDIUM DENSE			
0–2				40	0.0	
2–4				40	0.1	
4.7–6.2	CL		BROWN (10YR 5/3), LEAN CLAY WITH SAND, MOIST, SOFT			
4–6				60	0.0	
6.2–10.9	SP		BROWN (10YR 5/3), POORLY GRADED SAND (FINE) WITH GRAVEL, MOIST, MEDIUM DENSE			
6–8				60	0.1	
8–10				70	1.3	
10.9–19.2	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND (FINE TO COARSE), WET, LOOSE *12.6' WET			
10–12				70	0.3	
12–14				70	0.0	
14–16				70	0.0	
16–18				100	0.0	
18–20				100	0.0	
19.2–20	CL		YELLOWISH BROWN (10YR 5/3), LEAN CLAY, WET, SOFT			*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-57**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **11.9'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/18/2017**	DATE COMPLETED: **8/18/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			
1	CL		VERY DARK GRAY (10YR 3/1), LEAN CLAY, PLASTIC, COHESIVE, DRY, MEDIUM	80	0.0	
2			BROWN (10YR 5/3), CLAYEY SAND WITH GRAVEL, LOW PLASTICITY, DRY, MEDIUM DENSE			
3	D			80	0.0	
4						
5			BROWN (10YR 5/3), POORLY GRADED SAND (FINE) WITH GRAVEL, MOIST, MEDIUM DENSE	70	0.0	
6						
7				70	0.0	
8	SP					
9				80	0.1	
10						
11				80	0.1	
12			*11.9' WET			
13			YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND (FINE TO COARSE) WITH GRAVEL, WET, LOOSE	80	0.1	
14						
15				80	0.1	
16	SW					
17				40	0.0	
18						
19				40	0.1	
20						*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-58**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **10.4'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/18/2017**	DATE COMPLETED: **8/18/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0.5–10.4	SP		DARK BROWN (10YR 3/3), POORLY GRADED SAND (FINE), DRY, MEDIUM DENSE			
0–2				80	0.0	
2–4				80	0.0	
4–6				50	0.0	
6–8				50	0.0	
8–10				70	0.0	
10.4			*10.4' WET			
10.4–20	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND (FINE TO COARSE), WET, LOOSE			
10–12				70	0.1	
12–14				70	0.0	
14–16				70	0.0	
16–18				100	0.0	
18–20				100	0.0	*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: Former O'Neals Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-59	
DRILLING CONTRACTOR: Stock Drilling	DRILLER/LICENSE #: Ernie Phylor #4111WD	LOGGED BY/CHECK BY: J. Kinman/O. Purcell
DRILLING EQUIPMENT: Geoprobe 7330DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 20.0'	DEPTH TO WATER: 13.7'
SAMPLING METHOD: Dual Tube	DATE STARTED: 8/18/2017	DATE COMPLETED: 8/18/2017

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
	SM		VERY DARK BROWN (10YR 2/2), SILTY SAND, TRACE ORGANICS, DRY, MEDIUM DENSE			
1				80	0.0	
2						
3				80	0.0	
4	SW		YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND (FINE TO COARSE), MOIST, LOOSE			
5				90	0.2	
6						
7				90	0.4	
8						
9				90	0.4	
10						
11				90	0.1	
12			*12.0' INCREASED GRAVEL CONTENT			
13				80	0.0	
14			*13.7' WET			
15				80	0.0	
16						
17				100	0.0	
18						
19				100	0.1	
20						*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-60**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **12.3'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/18/2017**	DATE COMPLETED: **8/18/2017**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–3	SC		VERY DARK GRAY (10YR 3/1), CLAYEY SAND, DRY, DENSE	100	0.0	
				100	0.0	
3–5.5	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY, PLASTIC, COHESIVE, MOIST, MEDIUM	100	0.0	
5.5–12.5	SP		YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND, MOIST, MEDIUM DENSE	100	0.0	
				100	0.0	
				100	0.0	
				100	0.0	
			*12.3' WET			
12.5–20	SW		LIGHT YELLOWISH BROWN (10YR 6/4), WELL GRADED SAND (FINE TO COARSE) WITH GRAVEL, WET, LOOSE	100	0.1	
				100	0.1	
				100	0.0	
			*18.2' INCREASED SILT CONTENT			
20				100	0.0	*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-61**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **12.4'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/21/2017**	DATE COMPLETED: **8/21/2017**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		GRASS SURFACE			
0–3	SM	DARK BROWN (10YR 3/3), SILTY SAND, ORGANICS, DRY, MEDIUM DENSE	80 / 80	0.0 / 0.0	
3–8	SC	DARK BROWN (10YR 3/3), CLAYEY SAND, DRY, MEDIUM DENSE	75 / 75	0.0 / 0.0	
8–12	SP	BROWN (10YR 5/3), POORLY GRADED SAND, MOIST, MEDIUM DENSE	80 / 80	0.0 / 0.0	
12–20	SW	LIGHT YELLOWISH BROWN (10YR 6/4), WELL GRADED SAND (FINE TO COARSE) WITH GRAVEL, WET, LOOSE *12.4' WET	100 / 100 / 100 / 100	0.1 / 0.1 / 0.0 / 0.0	*16.0 GRAB GROUNDWATER SAMPLE COLLECTED

Sample intervals (% REC / PID): 0–2: 80 / 0.0; 2–4: 80 / 0.0; 4–6: 75 / 0.0; 6–8: 75 / 0.0; 8–10: 80 / 0.0; 10–12: 80 / 0.0; 12–14: 100 / 0.1; 14–16: 100 / 0.1; 16–18: 100 / 0.0; 18–20: 100 / 0.0

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-62**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **11.6'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/21/2017**	DATE COMPLETED: **8/21/2017**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		GRASS SURFACE			
0–4	SM	VERY DARK BROWN (10YR 2/2), SILTY SAND, ORGANICS, DRY, DENSE			
0–2			90	0.0	
2–4			90	0.0	
4–5	CL	VERY DARK GRAYISH BROWN (10YR 3/2), LEAN CLAY, MOIST, SOFT	90	0.0	
5–9.5	SC	VERY DARK GRAYISH BROWN (10YR 3/2), CLAYEY SAND, MOIST, MEDIUM DENSE			
6–8			90	0.1	
8–10			90	0.1	
9.5–11.6	SP	BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, MEDIUM DENSE			
10–12		*11.6' WET	90	0.4	
11.6–20	SW	BROWNISH YELLOW (10YR 6/6), WELL GRADED SAND (FINE TO COARSE) WITH GRAVEL, WET, LOOSE			
12–14			90	0.2	
14–16			90	0.1	
16–18			100	0.0	
18–20		*18.8' INCREASED GRAVEL CONTENT	100	0.2	*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-63**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **14.5'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/21/2017**	DATE COMPLETED: **8/21/2017**

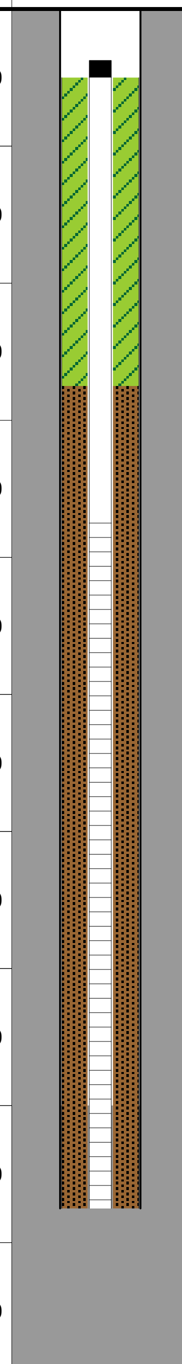
Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–4.2	SM		BROWN (10YR 4/3), SILTY SAND, ORGANICS, DRY, MEDIUM DENSE			
1				80	0.0	
3				80	0.0	
4.2–8.8	SC		BROWN (10YR 5/3), CLAYEY SAND, DRY, MEDIUM DENSE			
5				70	0.0	
7				70	0.0	
9				50	0.0	
8.8–14.5	SP		BROWN (10YR 4/3), POORLY GRADED SAND (FINE), MOIST, MEDIUM DENSE			
11				50	0.0	
13				90	0.0	
14.5			*14.5' WET			
14.5–20	SW		BROWNISH YELLOW (10YR 6/6), WELL GRADED SAND (FINE TO COARSE) WITH GRAVEL, WET, LOOSE			
15				90	0.0	
17				100	0.0	
19			*18.1' INCREASED GRAVEL CONTENT	100	0.0	
20						*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-64/MW-27**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **12.6'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/21/2017**	DATE COMPLETED: **8/22/2017**

Depth (feet)	USCS	Description	% REC	PID
0		CONCRETE SURFACE		
1	SC	BROWN (10YR 4/3), CLAYEY SAND, MOIST, MEDIUM DENSE	80	0.0
2–3			80	0.0
4–5	CL	BROWN (10YR 4/3), LEAN CLAY, PLASTIC, COHESIVE, MEDIUM, MOIST	80	0.0
6–7	SP	BROWN (10YR 4/3), POORLY GRADED SAND (FINE) MOIST, MEDIUM DENSE	80	0.0
8–9			80	0.0
10–11			80	0.0
12		*12.6' WET	70	0.0
13	SW	YELLOWISH BROWN (10YR 5/4), WELL GRADED SAND, LOOSE, WET		
14–15			70	0.0
16–17			100	0.0
18–19			100	0.0
20				

Well Construction



Flush mounted 10" cover
0.75-7.5' 2 in dia., sch. 40 PVC riser
0.75-5.5' Bentonite Seal
5.5-17.5 #4 Quartz Sand Pack
7.5-17.5' 2 in dia., 0.010" slot, sch. 40 PVC well screen
Drilling terminated at 20' bgs
*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

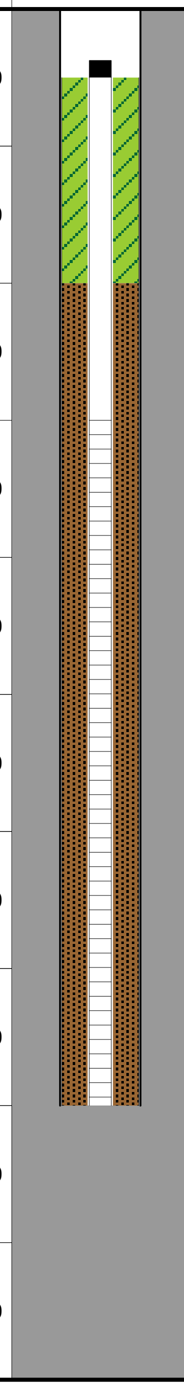
NOTES:

PROJECT: Former O'Neals Clothes Depot Cleaners	WILCOX PROJECT #: 341.14		
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: B-65/MW-28		
DRILLING CONTRACTOR: Stock Drilling	DRILLER/LICENSE #: Ernie Phylor #4111WD	LOGGED BY/CHECK BY: J. Kinman/O. Purcell	
DRILLING EQUIPMENT: Geoprobe 7330DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA	
DRILLING METHOD: Direct Push	TOTAL DEPTH: 20.0'	DEPTH TO WATER: 10.8'	
SAMPLING METHOD: Dual Tube	DATE STARTED: 8/21/2017	DATE COMPLETED: 8/22/2017	

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

Depth (feet)	USCS	Description	% REC	PID
0		GRASS SURFACE		
0–4	SM	YELLOWISH BROWN (10YR 5/4), SILTY SAND, ORGANICS, DRY, MEDIUM DENSE	70 / 70	0.0 / 0.0
4–8	SC	BROWN (10YR 4/3), CLAYEY SAND, MOIST, MEDIUM DENSE	50 / 50	0.0 / 0.0
8–10	SP	BROWN (10YR 4/3), POORLY GRADED SAND (FINE), MOIST, MEDIUM DENSE	60	0.0
10–20	SW	PALE BROWN (10YR 6/3), WELL GRADED SAND (FINE TO COARSE), WET, LOOSE *10.8' WET	60 / 90 / 90 / 100 / 100	0.0 / 0.0 / 0.0 / 0.0 / 0.0

Well Construction



Flush mounted 10" cover
0.75-6' 2 in dia., sch. 40 PVC riser
0.75-4' Bentonite Seal

4-16 #4 Quartz Sand Pack

6-16' 2 in dia., 0.010" slot, sch. 40 PVC well screen

Drilling terminated at 20' bgs

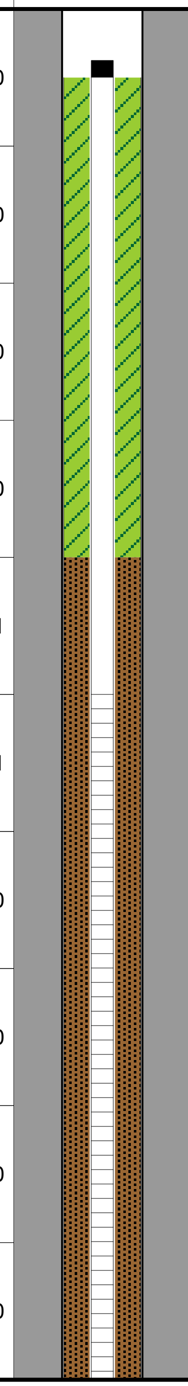
*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-66/MW-29**	
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.5'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/21/2017**	DATE COMPLETED: **8/22/2017**

Depth (feet)	USCS	Description	% REC	PID
0		CONCRETE SURFACE		
1	SM	DARK BROWN (10YR 3/3), SILTY SAND, ORGANICS, DRY, MEDIUM DENSE	30	0.0
3			30	0.0
4	SC	BROWN (10YR 4/3), CLAYEY SAND, DRY, MEDUM DENSE *4.0'-6.0' SOIL SAMPLE COLLECTED		
5			50	0.0
7			30	0.0
9			30	0.1
10	SP	BROWN (10YR 4/3), POORLY GRADED SAND (FINE), MEDIUM DENSE, MOIST *15.5' WET		
11			30	0.1
13	SW	YELLOWISH BROWN (10YR 5/6), WELL GRADED SAND (FINE TO COARSE), WET, LOOSE	50	0.0
15			50	0.0
17			40	0.0
19			40	0.0
20				

Well Construction



Flush mounted 10" cover
0.75-10' 2 in dia., sch. 40 PVC riser
0.75-8' Bentonite Seal

8-20 #4 Quartz Sand Pack

*20.0 GRAB GROUNDWATER SAMPLE COLLECTED

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**		
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **B-67**		
DRILLING CONTRACTOR: **Stock Drilling**	DRILLER/LICENSE #: **Ernie Phylor #4111WD**	LOGGED BY/CHECK BY: **J. Kinman/O. Purcell**	
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**	
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **12.4'**	
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **8/22/2017**	DATE COMPLETED: **8/22/2017**	

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			GRASS SURFACE			
0–5	SM		BROWN (10YR 4/3), SILTY SAND, ORGANICS, DRY, MEDIUM DENSE	80	0.0	
				80	0.0	
5–5.7	CL		BROWN (10YR 4/3), LEAN CLAY, MOIST, SOFT	90	0.0	
5.7–10.3	SC		BROWN (10YR 4/3), CLAYEY SAND, MOIST, MEDIUM DENSE	90	0.0	
				80	0.0	
10.3–12	SP		BROWNISH YELLOW (10YR 6/6), POORLY GRADED SAND (FINE), MOIST, MEDIUM DENSE	80	0.0	
12–20	SW		BROWNISH YELLOW (10YR 6/6), WELL GRADED SAND (FINE TO COARSE) WITH GRAVEL, WET, LOOSE *12.4' WET	100	0.0	
				100	0.0	
				100	0.0	
				100	0.0	*20.0 GRAB GROUNDWATER SAMPLE COLLECTED
20						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-68**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.0'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			CONCRETE/ASPHALT SURFACE			
0.5			FILL MATERIAL			
1	CL		DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	50	0.0	
3				50	0.0	
5				80	0.0	*4.0-5.0' SOIL SAMPLE COLLECTED
6						*6.0-7.0' SOIL SAMPLE COLLECTED
7	SP		DARK YELLOWISH BROWN (10YR 4/6) POORLY GRADED SAND, LITTLE GRAVEL, MOIST	80	0.0	
8			*8.0' WET			*GROUNDWATER SAMPLE COLLECTED
9				70	0.0	
9.5	SW		YELLOWISH BROWN (10YR 5/6) WELL GRADED SAND, WET, TRACE SILT			
11				70	0.0	
13				100	0.0	
15				100	0.0	
16						

NOTES:

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-69**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **7.8'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			ASPHALT SURFACE			
0.5			FILL MATERIAL			
1	CL		DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, LITTLE GRAVEL, MOIST, MEDIUM	70	0.1	
3				70	0.2	
5				50	0	
7				50	0.3	
7.3	SP		DARK YELLOWISH BROWN (10YR 4/6) POORLY GRADED SAND, TRACE SILT, MOIST *7.8' WET			
9				60	0	*GROUNDWATER SAMPLE COLLECTED *9.0-9.5' SOIL SAMPLE COLLECTED *10.0-11.0' SOIL SAMPLE COLLECTED
10.7	SW		YELLOWISH BROWN (10YR 5/6) WELL GRADED SAND, SILT, TRACE GRAVEL, WET			
11				60	0.2	
13				90	0.3	
15				90	0	
16						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-70**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.3'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			ASPHALT SURFACE			
			FILL MATERIAL			
1			DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, LITTLE GRAVEL, MOIST, MEDIUM	60	0.1	
2						
3				60	0.2	
4	CL					
5				70	0	
6						
7				70	0	
8			DARK YELLOWISH BROWN (10YR 4/6) POORLY GRADED SAND, TRACE SILT, MOIST *8.3' WET			
9	SP			40	0.3	*GROUNDWATER SAMPLE COLLECTED *9.0-9.5' SOIL SAMPLE COLLECTED
10						*10.0-11.0' SOIL SAMPLE COLLECTED
11			YELLOWISH BROWN (10 YR 5/6) WELL GRADED SAND, SILT, TRACE GRAVEL, WET	40	0	
12						
13	SW			90	0.1	
14						
15				90	0.1	
16						

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-71**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.5'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			ASPHALT SURFACE			
			FILL MATERIAL			
1	CL		BROWN (10YR 5/3) LEAN CLAY, TRACE GRAVEL, MOIST, MEDIUM	60	0	
3				60	0.2	
5				70	0.3	
7				70	0.2	
8	SP		PALE BROWN (10YR 6/3) POORLY GRADED SAND, MOIST, LOOSE, TRACE SILT *8.5' WET			
9				20	1	*GROUNDWATER SAMPLE COLLECTED *9.0-9.5' SOIL SAMPLE COLLECTED *10.0-11.0' SOIL SAMPLE COLLECTED
10.75	SW		YELLOWISH BROWN (10YR 5/6) WELL GRADED SAND, MOIST, LOOSE, TRACE GRAVEL			
11				NR	-	
13				60	0.2	
15				60	0.1	
16						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: Former O'Neals Clothes Depot Cleaners	WILCOX PROJECT #: 341.14
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: SB-72

DRILLING CONTRACTOR: SCS	DRILLER/LICENSE #: Troy	LOGGED BY/CHECK BY: G. Alfrey/O. Purcell
DRILLING EQUIPMENT: Geoprobe 7330DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 16.0'	DEPTH TO WATER: 8.5'
SAMPLING METHOD: Dual Tube	DATE STARTED: 6/6/19	DATE COMPLETED: 6/6/19

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			CONCRETE/ASPHALT SURFACE			
			FILL MATERIAL			
1	CL		BROWN (10YR 4/3) LEAN CLAY, TRACE SAND, MOIST, MEDIUM	40	0	
2						
3				40	0.2	
4						
5				70	0	
6						
7				70	0	
8	SP		BROWN (10YR 4/3) POORLY GRADED SAND, MOIST, LOOSE, TRACES GRAVEL *8.5' WET			
9				60	0	*GROUNDWATER SAMPLE COLLECTED *9.0-9.5' SOIL SAMPLE COLLECTED
10						*10.0-11.0' SOIL SAMPLE COLLECTED
11	SW		PALE BROWN (10YR 6/3) WELL GRADED SAND, WET, LOOSE (FINE-COARSE)	60	0	
12						
13				90	0	
14						
15				90	0.2	
16						

NOTES:

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-73**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.5'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			CONCRETE SURFACE			
			FILL MATERIAL			
1	CL		YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, MOIST, MEDIUM	30	0	
3				30	0	
5				40	0.2	
7				40	0.1	
8	SP		DARK YELLOWISH BROWN (10YR 4/6) POORLY GRADED SAND, MOIST, LOOSE *8.5' WET			
9				70	0	*GROUNDWATER SAMPLE COLLECTED *9.0-9.5' SOIL SAMPLE COLLECTED *10.0-11.0' SOIL SAMPLE COLLECTED
11				70	0	
11.5	SW		PALE BROWN (10YR 6/3) WELL GRADED SAND, WET, LOOSE			
13				80	0	
15				80	0	
16						

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-74**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.5'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Description	% REC	PID	
0		CONCRETE SURFACE			
0.5		FILL MATERIAL			
1	CL	DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY, TRACE SAND, MOIST, MEDIUM	40	0	
3			40	0.4	
5			20	0.1	
7			20	0.1	
8	SP	DARK YELLOWISH BROWN (10YR 4/6) POORLY GRADED SAND, MOIST, LOOSE, TRACE SILT *8.5' WET			
9			70	0.2	*GROUNDWATER SAMPLE COLLECTED *9.0-9.5' SOIL SAMPLE COLLECTED *10.0-11.0' SOIL SAMPLE COLLECTED
11			70	0	
11.5	SW	YELLOWISH BROWN (10YR 5/6) WELL GRADED SAND, MOIST/WET, LOOSE			
13			80	0	
15			80	0.2	
16					

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **SB-75**	
DRILLING CONTRACTOR: **SCS**	DRILLER/LICENSE #: **Troy**	LOGGED BY/CHECK BY: **G. Alfrey/O. Purcell**
DRILLING EQUIPMENT: **Geoprobe 7330DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.5'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **6/6/19**	DATE COMPLETED: **6/6/19**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	
0			CONCRETE SURFACE			
			FILL MATERIAL			
1	CL		DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, MOIST, MEDIUM	40	0.2	
2						
3				40	0.1	
4						
5				70	0.1	
6						
7				70	0.3	
8						
9	SP		DARK YELLOWISH BROWN (10YR 4/6) POORLY GRADED SAND, MOIST, LOOSE *8.5' WET	80	0.2	*GROUNDWATER SAMPLE COLLECTED
10						*9.0-9.5' SOIL SAMPLE COLLECTED
11				80	0	*10.0-11.0' SOIL SAMPLE COLLECTED
12	SW		DARK YELLOWISH BROWN (10YR 4/6) WELL GRADED SAND, WET, LOOSE			
13				80	0	
14						
15				80	0	
16						

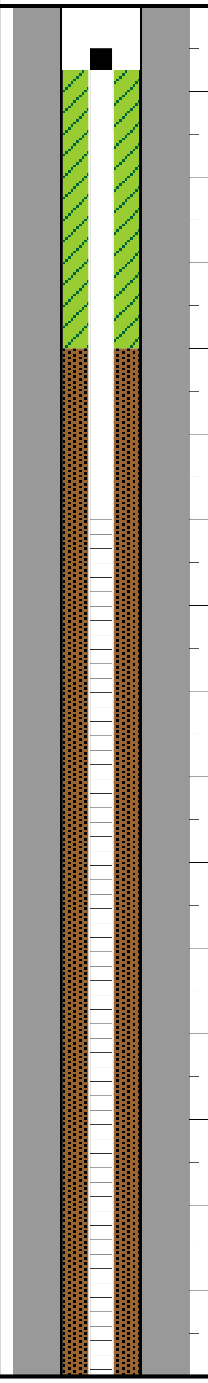
NOTES:

PROJECT: O'Neal's Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: MW-1	
DRILLING CONTRACTOR: Midway Services	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: C. Heckle/C. Bonniwell
DRILLING EQUIPMENT: Geoprobe 5410/CME-45	GROUND SURFACE ELEV.: 99.18	TOC ELEVATION: 98.57
DRILLING METHOD: HSA/Direct Push	TOTAL DEPTH: 16.0'	DEPTH TO WATER: 8.0'
SAMPLING METHOD: Dual Tube	DATE STARTED: 1/20/2015	DATE COMPLETED: 1/20/2015

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

Depth (feet)	USCS	Description	% REC	PID
0		ASPHALT SURFACE		
0–1	SW	PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE), TRACE GRAVEL, MOIST	50	0.0
1–2	CL	DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM		
2	SW	PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE), MOIST		
2–5	CL	DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM * 2.0' LARGE GRAVEL	50	0.0
4			70	0.0
5–8	SC	DARK YELLOWISH BROWN (10YR 4/6) CLAYEY SAND (COARSE), TRACE GRAVEL, MOIST	70	0.0
8	SW	PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE), WET		
8–9.4	SC	DARK YELLOWISH BROWN (10YR 4/6) CLAYEY SAND (COARSE), TRACE GRAVEL, MOIST	70	0.0
9.4–16	SW-SM	PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE) WITH SILT, WET * 11.2' CLAY LENSE	70	0.0
12			80	0.0
14			80	0.0

Well Construction



Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser
0.75-4.0' Bentonite Seal

4.0-16.0' #4 Quartz Sand Pack
* 4.0-5.0' SAMPLE COLLECTED

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

8.0'

Drilling terminated at 16.0' bgs

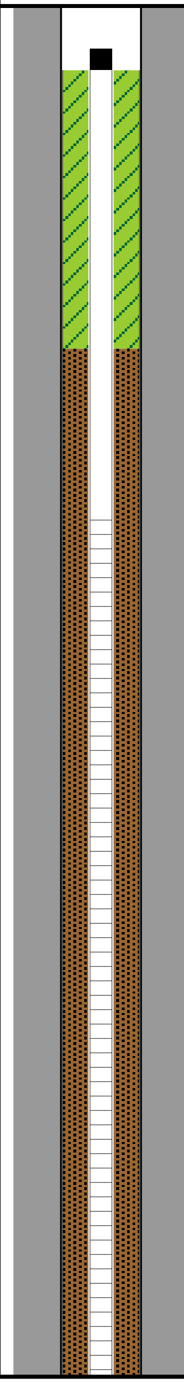
NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-2**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **C. Heckle/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410/CME-45**	GROUND SURFACE ELEV.: **100.43**	TOC ELEVATION: **99.99**
DRILLING METHOD: **HSA/Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **9.0'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **1/20/2015**	DATE COMPLETED: **1/20/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID
0			ASPHALT SURFACE		
0–3.5	CL		VERY DARK BROWN (10YR 2/2) LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	60	0.0
				60	0.0
3.5	SW		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE), MOIST		
4	CL		VERY DARK BROWN (10YR 2/2) LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	60	0.0
5.7	SC		DARK YELLOWISH BROWN (10YR 4/6) CLAYEY SAND (COARSE), MOIST	60	0.0
8.1	SP-SM		PALE BROWN (10YR 6/3) POORLY GRADED SAND (FINE) WITH SILT, TRACE GRAVEL	70	0.0
9.6	SW-SM		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET * 11.0' CLAY LENSE	70	0.0
11.3	CL		DARK YELLOWISH BROWN (10YR 4/6) LEAN CLAY WITH SAND, WET, MEDIUM		
11.6–16	SW-SM		PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET * 14.0' CLAY LENSE	80	0.0
				80	0.0

Well Construction



Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser
0.75-4.0' Bentonite Seal

* 3.0-5.0' SAMPLE COLLECTED

4.0-16.0' #4 Quartz Sand Pack

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

9.0'

Drilling terminated at 16.0' bgs

NOTES:

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-3**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **C. Heckle/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410/CME-45**	GROUND SURFACE ELEV.: **99.76**	TOC ELEVATION: **99.14**
DRILLING METHOD: **HSA/Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **8.8'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **1/20/2015**	DATE COMPLETED: **1/20/2015**

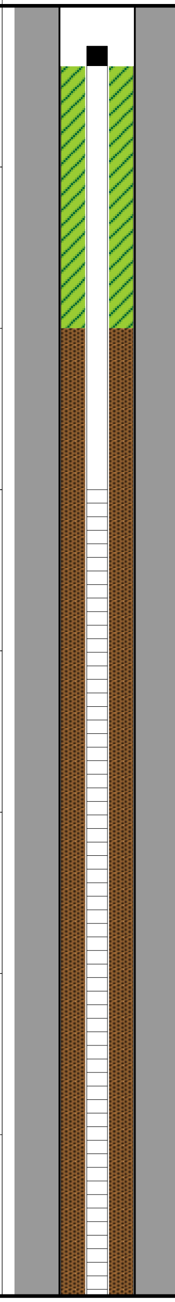
Depth (feet)	USCS	Description	% REC	PID	Well Construction
0		ASPHALT SURFACE			Flush mounted 10" cover
0–2	SC	VERY DARK BROWN (10YR 2/2) CLAYEY SAND (FINE), TRACE GRAVEL	60	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
2–5.5	CL	DARK YELLOWISH BROWN (10YR 4/4) LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	60	0.0	* 3.0-5.0' SAMPLE COLLECTED 4.0-16.0' #4 Quartz Sand Pack
			50	0.0	
5.5–8.2	SC	BROWN (10YR 5/3) CLAYEY SAND (FINE), VERY MOIST	50	0.0	6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
8.2–9.3	SP-SM	BROWN (10YR 5/3) POORLY GRADED SAND (FINE) WITH SILT	70	0.0	8.8'
9.3–9.8	SM	BROWN (10YR 5/3) SILTY SAND (FINE), WET			
9.8–16	SW-SM	PALE BROWN (10YR 6/3) WELL GRADED SAND (COARSE) WITH SILT, WET	70	0.0	
			70	0.0	
			70	0.0	Drilling terminated at 16.0' bgs

NOTES:

PROJECT:	WILCOX PROJECT #:	
O'Neal's Clothes Depot	**341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-4**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **C. Heckle/C. Bonniwell**
DRILLING EQUIPMENT: **Geoprobe 5410/CME-45**	GROUND SURFACE ELEV.: **98.83'**	TOC ELEVATION: **98.82'**
DRILLING METHOD: **HSA**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **10.2'**
SAMPLING METHOD: **Dual Tube/HSA**	DATE STARTED: **3/18/2015**	DATE COMPLETED: **3/18/2015**

Depth (feet)	USCS	Description	% REC	PID
0		ASPHALT SURFACE		
0–0.5	SW-SC	BROWN (10YR 4/3), WELL GRADED SAND (COARSE) WITH CLAY, MOIST, SLIGHTLY COHESIVE	70	0.3
1–6	CL	DARK YELLOWISH BROWN (10YR 4/6), LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	70 / 50	0.4 / 0.4
6	SC	DARK YELLOWISH BROWN (10YR 4/4), CLAYEY SAND (COARSE), MOIST	50	0.4
7–10.5	SP-SM	PALE BROWN (10YR 6/3), POORLY GRADED SAND (FINE) WITH SILT, MOIST * 10.2' WET	70 / 70	0.8 / 1.7
10.5–11	SW-SM	PALE BROWN (10YR 6/3), WELL GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET		
11	CL	PALE BROWN (10YR 6/3), LEAN CLAY, WET, MEDIUM		
11–16	SW-SM	PALE BROWN (10YR 6/3), WELL GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, WET	80 / 80	0.3 / 0.4

Well Construction



Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser
0.75-4.0' Bentonite Seal

* 3.0-4.0' SAMPLE COLLECTED

4.0-16.0' #4 Quartz Sand Pack

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

Drilling terminated at 16.0' bgs

NOTES:

PROJECT: O'Neal's Clothes Depot	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: MW-5	
DRILLING CONTRACTOR: Midway Services, Inc.	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: C. Heckle/C. Bonniwell
DRILLING EQUIPMENT: Geoprobe 5410/CME-45	GROUND SURFACE ELEV.: 99.14'	TOC ELEVATION: 98.60'
DRILLING METHOD: HSA	TOTAL DEPTH: 16.0'	DEPTH TO WATER: NA
SAMPLING METHOD: Dual Tube/HSA	DATE STARTED: 3/18/2015	DATE COMPLETED: 3/18/2015

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0	-		GRAVEL SURFACE			Flush mounted 10" cover
			SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-5. REFER TO BORING LOG B-5 FOR COMPLETE SOIL DESCRIPTION			
1						0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
2						
3						
4						4.0-16.0' #4 Quartz Sand Pack
5						
6						6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						Drilling terminated at 16.0' bgs

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

PROJECT: O'Neal's Clothes Depot	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: MW-6	
DRILLING CONTRACTOR: Midway Services, Inc.	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: C. Heckle/C. Bonniwell
DRILLING EQUIPMENT: Geoprobe 5410/CME-45	GROUND SURFACE ELEV.: 98.20'	TOC ELEVATION: 97.56'
DRILLING METHOD: HSA	TOTAL DEPTH: 16.0'	DEPTH TO WATER: 8.8'
SAMPLING METHOD: Dual Tube/HSA	DATE STARTED: 3/18/2015	DATE COMPLETED: 3/18/2015

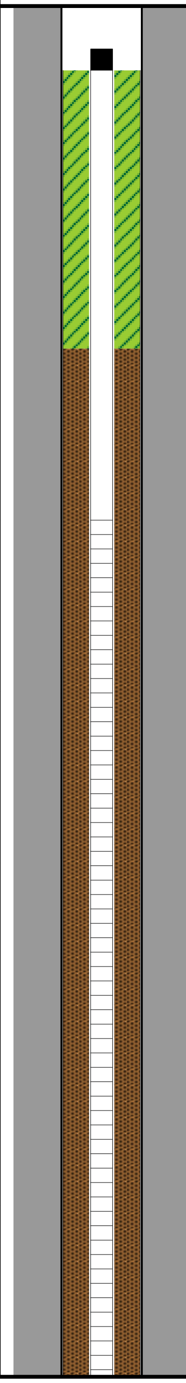
Depth (feet)	USCS	Description	% REC	PID	Well Construction
0		CONCRETE SURFACE			Flush mounted 10" cover
1	CL	BROWN (10YR 4/3), LEAN CLAY WITH SAND, TRACE GRAVEL, MOIST, MEDIUM	50	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
3			50	0.0	
4					4.0-16.0' #4 Quartz Sand Pack
5	SC	DARK YELLOWISH BROWN (10YR 4/6), CLAYEY SAND (COARSE), TRACE GRAVEL MOIST	60	0.1	* 5.0-6.5' SAMPLE COLLECTED
7			60	0.1	6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
9	SP-SM	PALE BROWN (10YR 6/3), POORLY GRADED SAND (COARSE) WITH SILT, TRACE GRAVEL, VERY MOIST * 8.8' WET	70	0.1	
11	ML	PALE BROWN (10YR 6/3), SILT, WET, MEDIUM	70	0.7	
11	SP-SM	PALE BROWN (10YR 6/3), POORLY GRADED SAND (COARSE) WITH SILT, WET			
13			70	2.2	
15			70	2.2	
16					Drilling terminated at 16.0' bgs

NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-7**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620 DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push/ HSA**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **9.8'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/24/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Description	% REC	PID
0		CONCRETE SURFACE		
0–5	ML	PALE BROWN (10YR 6/3), SILT WIH SAND, DRY, MEDIUM		
1			70	0.0
3			70	0.0
5			70	0.0
5–7.5	SP-SM	YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND WITH SILT, MOIST, MEDIUM DENSE		
7			70	0.0
7.5–16	SP	YELLOWISH BROWN (10YR5/6), POORLY GRADED SAND, MOIST, LOOSE		
9			60	0.0
9.8		* 9.8' WET		
11			60	0.0
11.4		* 11.4' COLOR CHANGE BROWN (10YR 5/3), COARSER SAND		
13			70	0.3
15			70	0.1
16				

Well Construction



Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser

0.75-4.0' Bentonite Seal

4.0-16.0' #4 Quartz Sand Pack

* 4.0-5.0' SAMPLE COLLECTED

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

Drilling terminated at 16.0' bgs

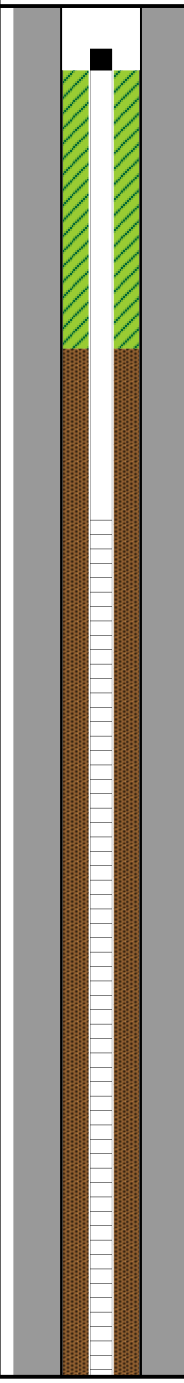
NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-8**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620 DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push/ HSA**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **9.7'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/24/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Description	% REC	PID
0		ASPHALT SURFACE		
0–2	SW	VERY DARK GRAY (10YR 3/1), WELL GRADED SAND, MOIST, LOOSE	40	0.0
2–6	CL	BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	40	0.0
			70	0.0
6–6.5	SP	YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE	70	0.0
6.5–8	CL	BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM		
8–16	SP	YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, MEDIUM DENSE * 9.7' WET * 9.8' COLOR CHANGE PALE BROWN (10YR 6/3) * 12.1' MORE COARSE SAND	60	0.0
			60	0.0
			70	0.0
			70	0.0

Well Construction



Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser
0.75-4.0' Bentonite Seal

4.0-16.0' #4 Quartz Sand Pack
* 4.0-5.0' SAMPLE COLLECTED

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

Drilling terminated at 16.0' bgs

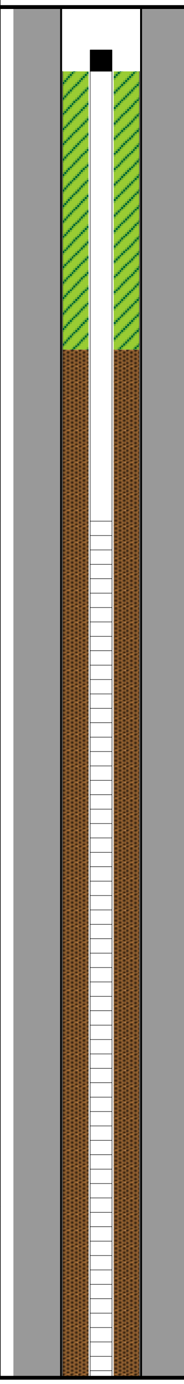
NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-9**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620 DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push/ HSA**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **10.6'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/24/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID
0			ASPHALT SURFACE		
1	CL		BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	50	0.0
3				50	0.0
5				30	0.0
7	SP		YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, LOOSE	30	0.0
8	SP-SM		PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE		
9				40	0.0
10.6			* 10.6' COARSE SAND, WET		
11				40	1.2
13				50	0.2
15				50	0.0
16					

Well Construction



Flush mounted 10" cover
0.75-6.0' 2 in dia., sch. 40 PVC riser
0.75-4.0' Bentonite Seal
4.0-16.0' #4 Quartz Sand Pack
* 4.0-5.0' SAMPLE COLLECTED
6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
Drilling terminated at 16.0' bgs

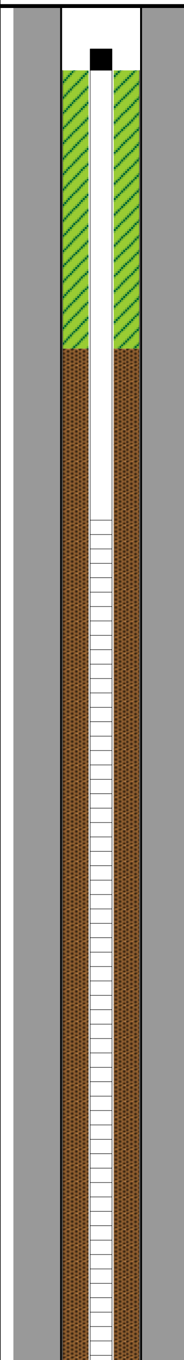
NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-10**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620 DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push/ HSA**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **10.2'**
SAMPLING METHOD: **Dual Tube**	DATE STARTED: **9/24/2015**	DATE COMPLETED: **9/25/2015**

Depth (feet)	USCS	Description	% REC	PID
0		ASPHALT SURFACE		
0–2	SW	BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	30	0.0
2–8	CL	BROWN (10YR 4/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	30	0.3
			30	0.0
			30	0.0
8–12	SP	DARK BROWN (10YR 3/3), POORLY GRADED SAND, MOIST, LOOSE * 8.7' COLOR CHANGE PALE BROWN (10YR 6/3) * 10.2' WET	50	0.0
			50	0.0
12–16	SP	PALE BROWN (10YR 6/3), POORLY GRADED SAND (COARSE), WET, LOOSE	50	0.2
			50	0.1

Well Construction



Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser
0.75-4.0' Bentonite Seal

4.0-16.0' #4 Quartz Sand Pack
* 3.0-4.0' SAMPLE COLLECTED

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
* 6.0-7.0' SAMPLE COLLECTED

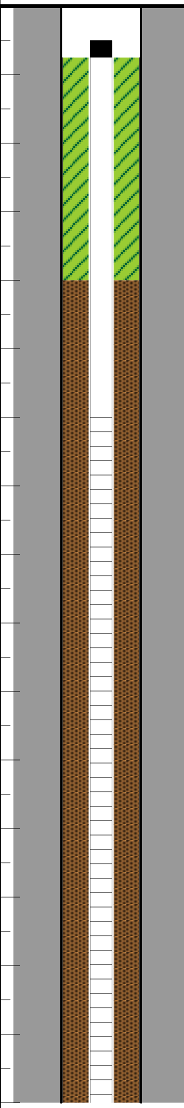
Drilling terminated at 16.0' bgs

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-11**

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **CME-45**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **12/16/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Description	% REC	PID
0		ASPHALT SURFACE		
0–2	SW	BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	40	0.0
2–8	CL	DARK BROWN (10YR 3/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	40	0.0
			60	0.0
			60	0.0
8–16	SP	YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, MEDIUM DENSE	60	0.0
			60	0.0
			60	0.0
		* 13.2' WET	60	0.0



Notes:

Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser

0.75-4.0' Bentonite Seal

4.0-16.0' #4 Quartz Sand Pack

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

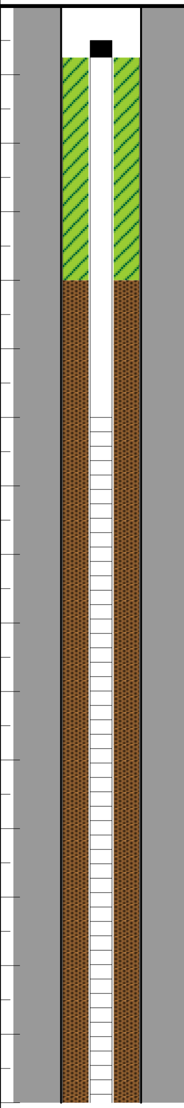
Drilling terminated at 16.0' bgs

NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-13.

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-12**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **CME-45**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **12/16/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		CONCRETE SURFACE			Flush mounted 10" cover
0–1	SW	PALE BROWN (10YR 6/3), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	20	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
1–4	CL	YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	20	0.0	
4–16	SP	YELLOWISH BROWN (10YR 5/6), POORLY GRADED SAND, MOIST, MEDIUM	70	0.0	4.0-16.0' #4 Quartz Sand Pack
			70	0.0	6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
			70	0.0	
			70	0.1	
		* 12.1' VERY COARSE SAND, WET	60	0.0	
			60	0.0	Drilling terminated at 16.0' bgs



NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-14.

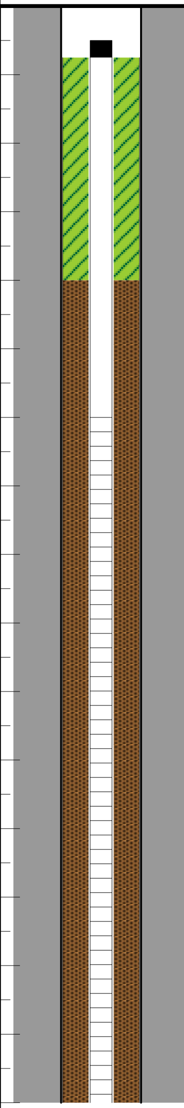
WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-13**

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **CME-45**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **12/16/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Description
0		GRAVEL SURFACE
0.25–0.75	SW	BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE
0.75–5.75	SP-SC	DARK YELLOWISH BROWN (10YR 4/6), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM
5.75–6.25	CL	YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM
6.25–11.3	SP-SC	DARK YELLOWISH BROWN (10YR 4/6), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM
11.3–11.6	CL	BROWN (10YR 5/3), LEAN CLAY WITH SAND, MOIST, MEDIUM
11.6–16.0	SP-SC	DARK YELLOWISH BROWN (10YR 4/6), POORLY GRADED SAND WITH CLAY, MOIST, MEDIUM * 12.3' PALE BROWN (10YR 6/3), WET

Sample Interval (feet)	% REC	PID
0–2	70	0.0
2–4	70	0.0
4–6	60	0.0
6–8	60	0.1
8–10	60	0.2
10–12	60	0.1
12–14	90	0.1
14–16	90	0.0



Notes:

Flush mounted 10" cover

0.75-6.0' 2 in dia., sch. 40 PVC riser

0.75-4.0' Bentonite Seal

4.0-16.0' #4 Quartz Sand Pack

6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

Drilling terminated at 16.0' bgs

NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-20.

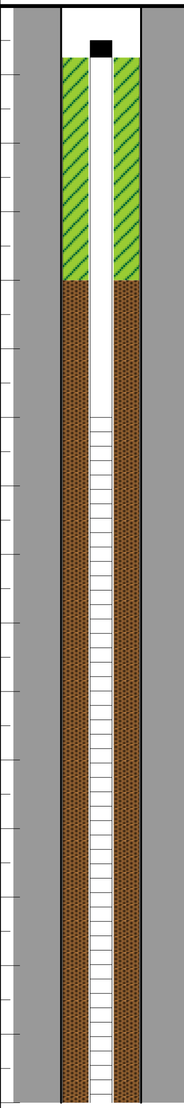
WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-14**
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** — LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **CME-45**	GROUND SURFACE ELEV.: **NA** — TOC ELEVATION: **NA**
	DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'** — DEPTH TO WATER: **NA**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/16/2015** — DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		CONCRETE SURFACE			Flush mounted 10" cover
0–1	SW	GRAY (10YR 5/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	5	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
1–4	CL	BROWN (10YR 5/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	5	0.0	
4–6		4.0-16.0' NO RECOVERY	-	-	4.0-16.0' #4 Quartz Sand Pack
6–8			-	-	6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
8–10			-	-	
10–12	-		-	-	
12–14			-	-	
14–16			-	-	Drilling terminated at 16.0' bgs

NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-24.

WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-15**	
	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
	DRILLING EQUIPMENT: **CME-45**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
	SAMPLING METHOD: **NA**	DATE STARTED: **12/16/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Notes
0			CONCRETE SURFACE			Flush mounted 10" cover
	SW		GRAYISH BROWN (10YR 5/2), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE			
1	CL		YELLOWISH BROWN (10YR 5/4), LEAN CLAY WITH SAND, MOIST, MEDIUM	20	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
2						
3				20	0.0	
4						4.0-16.0' #4 Quartz Sand Pack
5				70	0.0	
6						6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
7	SP		DARK YELLOWISH BROWN (10YR 4/4), POORLY GRADED SAND, MOIST, LOOSE	70	0.0	
8						
9				70	0.1	
10						
11				70	0.2	
			* 11.5' PALE BROWN (10YR 6/3)			
12			* 12.0' WET			
13				90	0.0	
14						
15				90	0.0	Drilling terminated at 16.0' bgs
16						
17						
18						
19						
20						



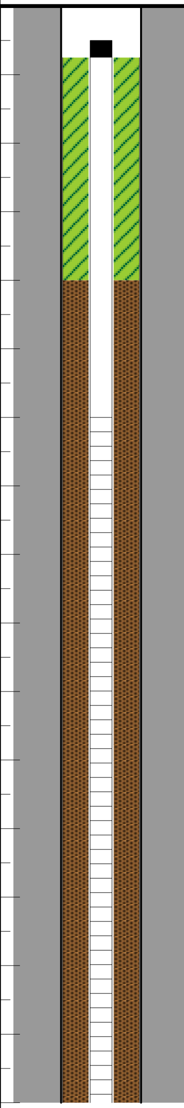
NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-23.

PROJECT: **Clothes Depot**		WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**		WELL/BORING ID: **MW-16**	
DRILLING CONTRACTOR: **Midway Services, Inc.**		DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **CME-45**		GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**		TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**		DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

Depth (feet)	USCS	Description	% REC	PID	Notes
0		GRAVEL SURFACE			Flush mounted 10" cover
0–1.5	SW	BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	50	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
1.5–5.2	CL	DARK BROWN (10YR 3/3), LEAN CLAY WITH SAND, MOIST, MEDIUM	50	0.1	
			80	0.1	4.0-16.0' #4 Quartz Sand Pack
5.2–10.8	SW-SC	DARK YELLOWISH BROWN (10YR 4/4), WELL GRADED SAND WITH SOME CLAY, MOIST, MEDIUM DENSE	80	0.1	6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
			60	0.1	
10.8–16	SP	PALE BROWN (10YR 6/3), POORLY GRADED SAND (VERY COARSE), MOIST, LOOSE	60	0.0	
		* 12.6' WET	70	0.2	
			70	0.3	Drilling terminated at 16.0' bgs

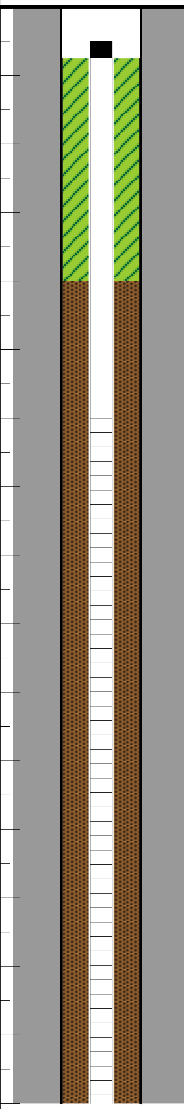
Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20



NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-26.

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-17**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/C. Bonniwell**
DRILLING EQUIPMENT: **CME-45**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **12/18/2015**	DATE COMPLETED: **12/18/2015**

Depth (feet)	USCS	Description	% REC	PID	Notes
0		CONCRETE SURFACE			Flush mounted 10" cover
0–1	SW	BLACK (10YR 2/1), WELL GRADED SAND WITH GRAVEL, MOIST, LOOSE	50	0.0	0.75-6.0' 2 in dia., sch. 40 PVC riser 0.75-4.0' Bentonite Seal
1–2.6	CL	DARK YELLOWISH BROWN (10YR 4/4), LEAN CLAY WITH SAND, MOIST, MEDIUM			
2.6–16	SP	PALE BROWN (10YR 6/3), POORLY GRADED SAND, MOIST, LOOSE	50	0.1	
4–6			80	0.1	4.0-16.0' #4 Quartz Sand Pack
6–8			80	0.1	6.0-16.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
8–10			60	0.1	
10–12		* 10.4' SAND (VERY COARSE)	60	0.0	
12–14		* 12.2' WET	70	0.2	
14–16			70	0.3	Drilling terminated at 16.0' bgs

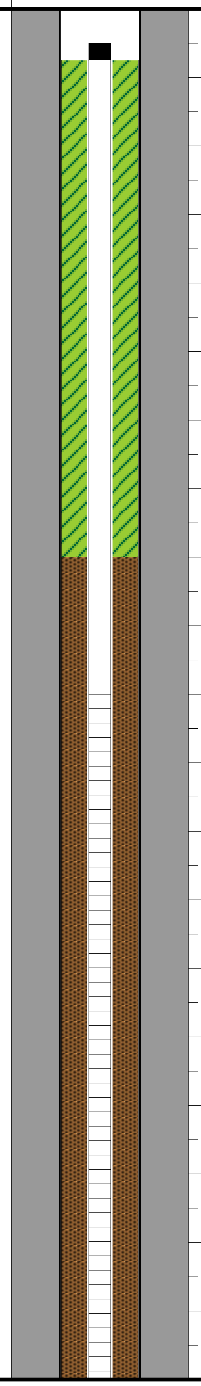


NOTES: SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-28.

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-18**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **CME-55**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **1/8/2016**	DATE COMPLETED: **1/8/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			GRASS SURFACE			Flush mounted 10" cover
0–4.6	CL		SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-36. REFER TO BORING B-36 FOR COMPLETE SOIL DESCRIPTIONS.			0.75-10.0' 2 in dia., sch. 40 PVC riser 0.75-8.0' Bentonite Seal
4.6–8.2	SP					8.0-20.0' #4 Quartz Sand Pack
8.2–10.7	CL					10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
10.7–20	SP					Drilling terminated at 20.0' bgs



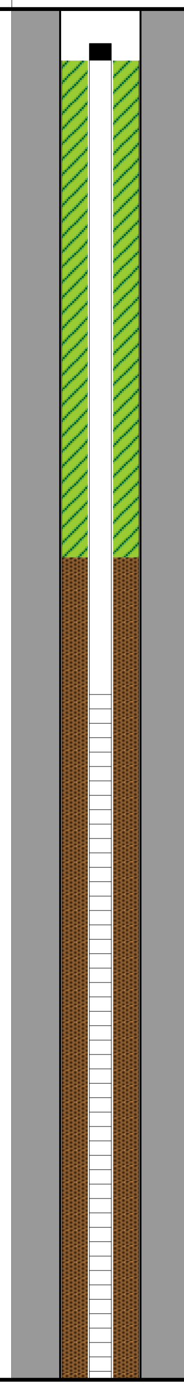
NOTES:

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-19**

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **CME-55**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **1/8/2016**	DATE COMPLETED: **1/8/2016**

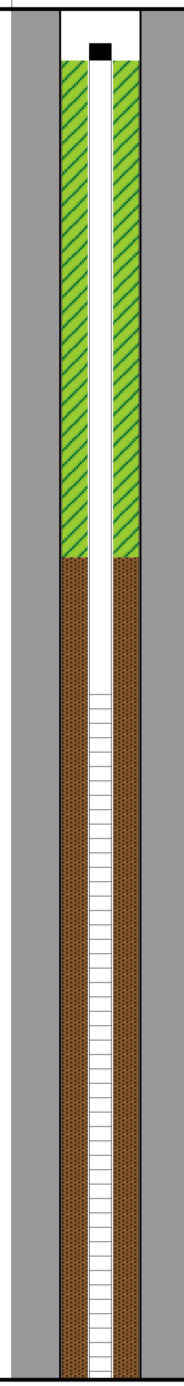
Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			ASPHALT SURFACE			Flush mounted 10" cover
0–0.75	SW		SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-33. REFER TO BORING B-33 FOR COMPLETE SOIL DESCRIPTIONS.			
0.75–6.4	CL					0.75-10.0' 2 in dia., sch. 40 PVC riser 0.75-8.0' Bentonite Seal
6.4–20	SP					8.0-20.0' #4 Quartz Sand Pack 10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen Drilling terminated at 20.0' bgs



NOTES:

	PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-20**	
WILCOX ENVIRONMENTAL ENGINEERING	DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
AIR | LAND | WATER	DRILLING EQUIPMENT: **CME-55**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
	SAMPLING METHOD: **NA**	DATE STARTED: **1/8/2016**	DATE COMPLETED: **1/8/2016**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			GRAVEL SURFACE			Flush mounted 10" cover
0–10	CL		SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-41. REFER TO BORING B-41 FOR COMPLETE SOIL DESCRIPTIONS.			0.75-10.0' 2 in dia., sch. 40 PVC riser 0.75-8.0' Bentonite Seal 8.0-20.0' #4 Quartz Sand Pack
10–20	SP					10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen Drilling terminated at 20.0' bgs



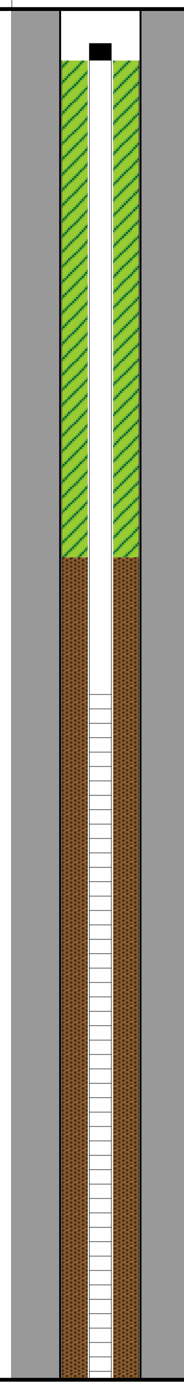
NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Clothes Depot**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-21**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **Z. Wojcik/ J. Kinman**
DRILLING EQUIPMENT: **CME-55**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow Stem Auger**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **1/8/2016**	DATE COMPLETED: **1/8/2016**

Depth (feet)	USCS	Description	% REC	PID
0		GRASS SURFACE		
0.4–7.2	CL	SOIL SAMPLING AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORING B-43. REFER TO BORING B-43 FOR COMPLETE SOIL DESCRIPTIONS.		
7.2–8.2	SP			
8.2–9.7	CL			
9.7–12	SP			
12–16	-			
16–20	SP			

Well Construction



Flush mounted 10" cover

0.75-10.0' 2 in dia., sch. 40 PVC riser
0.75-8.0' Bentonite Seal

8.0-20.0' #4 Quartz Sand Pack

10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen

Drilling terminated at 20.0' bgs

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: Former O'Neals Clothes Depot Cleaners	WILCOX PROJECT #: 341.14
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: MW-22

DRILLING CONTRACTOR: Midway Services, Inc.	DRILLER/LICENSE #: J. Toddish/#1946WD	LOGGED BY/CHECK BY: J. Kinman/J. Kinman
DRILLING EQUIPMENT: Geoprobe 6620DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Hollow-Stem Auger	TOTAL DEPTH: 20.0'	DEPTH TO WATER: 14.9'
SAMPLING METHOD: Direct Push-Dual Tube	DATE STARTED: 9/8/2016	DATE COMPLETED: 9/9/2016

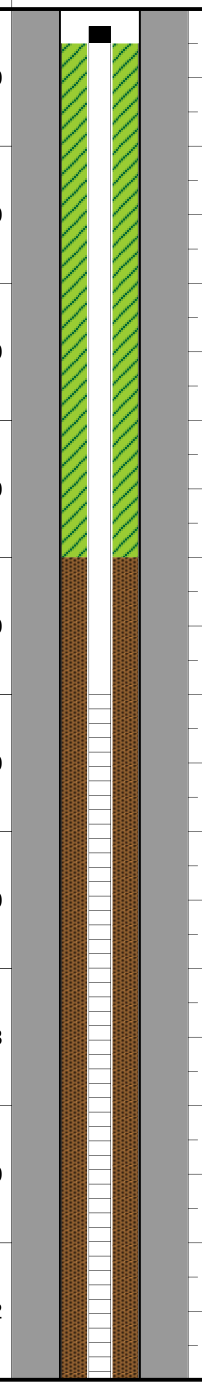
Depth (feet)	USCS	Description	% REC	PID	Well Construction
0		GRASS SURFACE			Flush mounted 10" cover
0–3	ML	BROWN (10YR 4/3), SILT WITH SAND, HIGH ORGANIC AND ROOT CONTENT, MOIST, SOFT			0.25-10.0' 2 in dia., sch. 40 PVC riser; 0.5-8.0' Bentonite Seal
1			65	0.0	
3			75	0.0	
3–7	SC	YELLOWISH BROWN (10YR 5/6), CLAYEY SAND WITH SILT, MOIST, MEDIUM STIFF			
5			70	0.0	
7			75	0.0	
7–9	SP-SC	YELLOWISH BROWN (10YR 5/6), POORLY GRADE SAND WITH CLAY, MOIST, MEDIUM DENSE			
8					8.0-20.0' #4 Quartz Sand Pack
9	SP	BROWN (10YR 5/3), POORLY GRADED SAND (FINE TO COARSE), MOIST, MEDIUM DENSE	75	0.0	
10					10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
11		* 11.1' SAND (VERY FINE TO FINE), SLIGHTLY MOIST, VERY LOOSE	75	0.0	
13			85	0.0	
15		* 14.9' SAND (FINE TO COARSE), MEDIUM DENSE	80	0.6	
17			75	0.3	
19			70	0.0	Drilling terminated at 20.0' bgs
20					

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-23**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **J. Kinman/J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow-Stem Auger**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **14.7'**
SAMPLING METHOD: **Direct Push-Dual Tube**	DATE STARTED: **9/8/2016**	DATE COMPLETED: **9/9/2016**

Depth (feet)	USCS	Description	% REC	PID	Well Construction
0	ML	GRASS SURFACE BROWN (10YR 4/3), SANDY LEAN CLAY, WITH ROOTS AND ORGANIC MATTER, MOIST, SOFT			Flush mounted 10" cover 0.25-10.0' 2 in dia., sch. 40 PVC riser 0.5-8.0' Bentonite Seal
1			25	0.0	
2	ML				
3			35	0.0	
4	SP	YELLOWISH BROWN (10YR 5/4), POORLY GRADED SAND (VERY FINE TO MEDUM), MOIST, VERY LOOSE			
5			45	0.0	
6					
7			55	0.0	
8					8.0-20.0' #4 Quartz Sand Pack
9			75	0.0	
10					10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
11		* 10.6' SAND (FINE TO COARSE), MEDIUM DENSE	80	0.0	
12	SP				
13			80	0.0	
14					
15		* 14.7' WET	80	0.3	
16					
17		* 17.1' SAND (VERY FINE TO MEDIUM), MEDUM DENSE	75	0.0	
18					
19			80	0.2	Drilling terminated at 20.0' bgs
20					

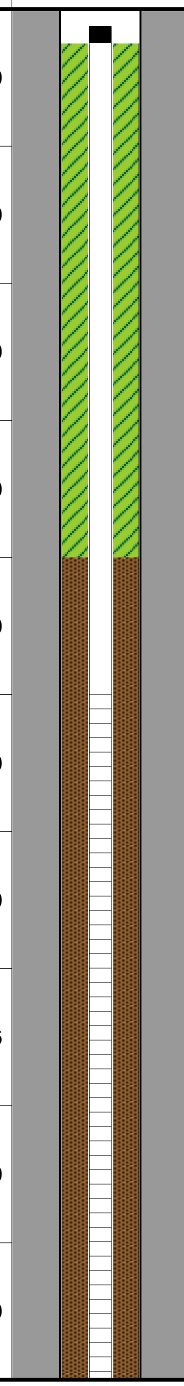


NOTES:

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-24**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **J. Kinman/J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow-Stem Auger**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **15.2'**
SAMPLING METHOD: **Direct Push-Dual Tube**	DATE STARTED: **9/8/2016**	DATE COMPLETED: **9/9/2016**

Depth (feet)	USCS	Description	% REC	PID
0	-	ASPHALT SURFACE		
	.	GRAVEL BASE		
1	SC	YELLOWISH BROWN (10YR 5/4), CLAYEY SAND, MOIST, MEDIUM STIFF	35	0.0
3			65	0.0
5			75	0.0
7		* 6.3' MOIST, SOFT	85	0.0
9			75	0.0
11	ML	YELLOWISH BROWN (10YR 5/6), SILT WITH SAND, MOIST, SOFT	80	0.0
	CL	YELLOWISH BROWN (5/6), SANDY LEAN CLAY AND POORLY GRADED SAND, MOIST		
13	SP	BROWN (10YR 5/3), POORLY GRADED SAND, SLIGHTLY MOIST, LOOSE	75	0.0
15			75	0.6
17			65	0.0
19		* 20.0' SAND (MEDIUM TO VERY COARSE)	85	0.0

Well Construction



Flush mounted 10" cover
0.25-10.0' 2 in dia., sch. 40 PVC riser
0.5-8.0' Bentonite Seal
8.0-20.0' #4 Quartz Sand Pack
10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
Drilling terminated at 20.0' bgs

NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-25**	
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD**	LOGGED BY/CHECK BY: **J. Kinman/J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow-Stem Auger**	TOTAL DEPTH: **20.0'**	DEPTH TO WATER: **16.1'**
SAMPLING METHOD: **Direct Push-Dual Tube**	DATE STARTED: **9/8/2016**	DATE COMPLETED: **9/9/2016**

Depth (feet)	USCS	Description	% REC	PID	Well Construction
0	SP-SC	GRASS SURFACE BROWN (10YR 4/3), POORLY GRADED SAND WITH CLAY, MOIST, VERY LOOSE			Flush mounted 10" cover 0.25-10.0' 2 in dia., sch. 40 PVC riser 0.5-8.0' Bentonite Seal
1			45	0.0	
2					
3			60	0.0	
4	SP	BROWN (10YR 4/3), POORLY GRADED SAND (FINE TO MEDIUM), MIOST, VERY LOOSE			
5			65	0.0	
6					
7			70	0.0	
8					8.0-20.0' #4 Quartz Sand Pack
9		* 9.3' SAND (FINE TO MEDIUM)	65	0.0	
10					10.0-20.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
11			75	0.0	
12					
13			80	0.0	
14					
15		* 15.3' VERY MOIST, MEDIUM DENSE * 16.1' WET	85	0.0	
16					
17			80	0.0	
18					
19			90	0.0	Drilling terminated at 20.0' bgs
20					

NOTES:

PROJECT: **Former O'Neals Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **MW-26**
DRILLING CONTRACTOR: **Midway Services, Inc.**	DRILLER/LICENSE #: **J. Toddish/#1946WD** ; LOGGED BY/CHECK BY: **J. Kinman/J. Kinman**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA** ; TOC ELEVATION: **NA**
DRILLING METHOD: **Hollow-Stem Auger**	TOTAL DEPTH: **20.0'** ; DEPTH TO WATER: **12.2'**
SAMPLING METHOD: **Direct Push-Dual Tube**	DATE STARTED: **9/8/2016** ; DATE COMPLETED: **9/9/2016**

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

Depth (feet)	USCS	Description	% REC	PID	Well Construction
0	-	CONCRETE SURFACE			Flush mounted 10" cover
	.	GRAVEL BASE			0.25-7.0' 2 in dia., sch. 40 PVC riser
1	SC	BROWN (10YR 4/3), CLAYEY SAND, MOIST, SOFT	25	0.0	0.5-5.0' Bentonite Seal
3			15	0.0	
5			35	0.0	5.0-17.0' #4 Quartz Sand Pack
7			65	0.0	7.0-17.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
8	SP	BROWN (10YR 4/3), POORLY GRADED SAND, MOIST, VERY LOOSE			
9			45	0.0	
11		* 11.6' VERY MOIST	75	0.6	
12		* 12.2' WET			
13			65	0.7	
14	ML	LIGHT BROWN (10YR 5/3), SILT WITH SAND, WET, SOFT			
15	SP	BROWN (10YR 4/3), POORLY GRADED SAND (VERY FINE TO MEDIUM), WET, LOOSE	70	0.8	
17			75	0.6	
19		* 19.4' LAYERS (0.5") OF SILT, WET, SOFT	75	0.3	Drilling terminated at 20.0' bgs
20					

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-1**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/1/2018**	DATE COMPLETED: **8/1/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
1						
2						
3						
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10						
11						
12						
13						
14						
15						
16						

NOTES:

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-2**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **7/31/2018**	DATE COMPLETED: **7/31/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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NOTES:

WILCOX ENVIRONMENTAL ENGINEERING

AIR | LAND | WATER

PROJECT: O'Neal's Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: IP-3	
DRILLING CONTRACTOR: Midway Services	DRILLER/LICENSE #: Mark Hicks #1945	LOGGED BY/CHECK BY: O. Purcell/N. Muller
DRILLING EQUIPMENT: Geoprobe 6620DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 16.0'	DEPTH TO WATER: NA
SAMPLING METHOD: NA	DATE STARTED: 7/31/2018	DATE COMPLETED: 7/31/2018

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-4**
	DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
	DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
	SAMPLING METHOD: **NA**	DATE STARTED: **7/31/2018**	DATE COMPLETED: **7/31/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-5**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/1/2018**	DATE COMPLETED: **8/1/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: O'Neal's Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: IP-6	
DRILLING CONTRACTOR: Midway Services	DRILLER/LICENSE #: Mark Hicks #1945	LOGGED BY/CHECK BY: O. Purcell/N. Muller
DRILLING EQUIPMENT: Geoprobe 6620DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 16.0'	DEPTH TO WATER: NA
SAMPLING METHOD: NA	DATE STARTED: 7/31/2018	DATE COMPLETED: 7/31/2018

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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	PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-7**	
WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
	DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
	SAMPLING METHOD: **NA**	DATE STARTED: **8/18/2018**	DATE COMPLETED: **8/1/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**		
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-8**		
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**	
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**	
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**	
SAMPLING METHOD: **NA**	DATE STARTED: **7/31/2018**	DATE COMPLETED: **7/31/2018**	

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-9**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **7/31/2018**	DATE COMPLETED: **7/31/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-10**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/2/2018**	DATE COMPLETED: **8/2/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-11**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/2/2018**	DATE COMPLETED: **8/2/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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PROJECT: O'Neal's Clothes Depot Cleaners	WILCOX PROJECT #: 341.14	
LOCATION: 833 East Morgan Street, Martinsville, IN	WELL/BORING ID: IP-12	
DRILLING CONTRACTOR: Midway Services	DRILLER/LICENSE #: Mark Hicks #1945	LOGGED BY/CHECK BY: O. Purcell/N. Muller
DRILLING EQUIPMENT: Geoprobe 6620DT	GROUND SURFACE ELEV.: NA	TOC ELEVATION: NA
DRILLING METHOD: Direct Push	TOTAL DEPTH: 16.0'	DEPTH TO WATER: NA
SAMPLING METHOD: NA	DATE STARTED: 8/1/2018	DATE COMPLETED: 8/1/2018

WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING AIR | LAND | WATER	PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**
	LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-13**
	DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945** / LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
	DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA** / TOC ELEVATION: **NA**
	DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'** / DEPTH TO WATER: **NA**
	SAMPLING METHOD: **NA**	DATE STARTED: **8/2/2018** / DATE COMPLETED: **8/2/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-14**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/1/2018**	DATE COMPLETED: **8/1/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-15**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/2/2018**	DATE COMPLETED: **8/2/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-16**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/1/2018**	DATE COMPLETED: **8/1/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-17**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/1/2018**	DATE COMPLETED: **8/1/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**		
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-18**		
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**	
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**	
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**	
SAMPLING METHOD: **NA**	DATE STARTED: **8/1/2018**	DATE COMPLETED: **8/1/2018**	

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT: **O'Neal's Clothes Depot Cleaners**	WILCOX PROJECT #: **341.14**	
LOCATION: **833 East Morgan Street, Martinsville, IN**	WELL/BORING ID: **IP-19**	
DRILLING CONTRACTOR: **Midway Services**	DRILLER/LICENSE #: **Mark Hicks #1945**	LOGGED BY/CHECK BY: **O. Purcell/N. Muller**
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.: **NA**	TOC ELEVATION: **NA**
DRILLING METHOD: **Direct Push**	TOTAL DEPTH: **16.0'**	DEPTH TO WATER: **NA**
SAMPLING METHOD: **NA**	DATE STARTED: **8/2/2018**	DATE COMPLETED: **8/2/2018**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID	Well Construction
0			SOIL SAMPLE AND CLASSIFICATION NOT PERFORMED DUE TO PROXIMITY TO BORINGS MW-09 AND MW-10. REFER TO BORING LOGS MW-09 AND MW-10 FOR COMPLETE SOIL DESCRIPTION.			
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APPENDIX E

OMM Plan

Indianapolis, IN
Ft. Wayne, IN
Evansville, IN
Cincinnati, OH

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Vapor Mitigation System
Operation, Maintenance, and Monitoring Plan

Former O'Neal's Clothes Depot Cleaners
740 East Washington Street Residence
Martinsville, Indiana
State Cleanup Site #0000402
Wilcox Project #341.14

Prepared for:

Mr. John O'Neal
c/o Dr. David L. Guevara
Taft Stettinius & Hollister LLP
One Indiana Square, Suite 3500
Indianapolis, Indiana 46204

Prepared by:

Wilcox Environmental Engineering, Inc.
Speedway, Indiana

October 31, 2019

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APPENDICES

INTRODUCTION

The former O'Neal's Clothes Depot Cleaners facility is located at 833 East Morgan Street, Martinsville, Indiana (the "site"), and contains a one-story building that was constructed in 1983 and operated as an active dry-cleaning facility from 1987 to 1996, and 1997 to 2011. The site operated as a drop-off facility from 1996 to 1997, and since 2011. The site is located east of the intersection of North Colfax Street and East Morgan Street in Martinsville, Morgan County, Indiana. An unnamed alley runs west-east along the southern edge of the property. The site is located in Washington Township (Township 12 North, Range 1 East, Section 34).

A suspected release was discovered in October 2014 based on laboratory data reporting tetrachloroethene (PCE) in soil exceeding the Indiana Department of Environmental Management (IDEM) *Remediation Closure Guide* (RCG) residential migration to groundwater screening level (RMTGSL). The site was entered into the IDEM State Cleanup Program and assigned Incident #0000402, with the pertinent contaminants of concern (COCs) being chlorinated volatile organic compounds (cVOCs) namely: PCE, trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), and vinyl chloride (VC).

This Operation, Maintenance, and Monitoring (OMM) Plan has been prepared to define activities associated with the vapor mitigation system (VMS) installed at the 740 East Washington Street residence. The OMM Plan incorporates specific information regarding the VMS and comprehensive protocols for operation, monitoring, data acquisition, reporting, and maintenance activities. The VMS was installed as a pre-emptive action based on sub-slab vapor concentrations and not due to confirmed vapor intrusion (VI).

BACKGROUND

PCE in groundwater was discovered at levels exceeding the RCG residential vapor intrusion groundwater screening level (RVIGWSL) southwest of the site. Wilcox identified the structure at 740 East Washington Street as being within the RVIGWSL 100-foot buffer zone, and initiated access request activities to the property owners in accordance with the November 13, 2015 IDEM *Procedures for Gaining Access to Third Party Properties by Participants Performing Investigation or Remediation document*.

The results from the March 24, 2017 VI sampling event at the 740 East Washington residence place it under *Scenario 6 (Remedy)* from IDEM's February 2014 *Vapor Remedy Selection and Implementation* guidance document. Based on the March 2017 vapor data and subsequent correspondence with IDEM, Wilcox determined that the 740 East Washington Street residence required the installation of a vapor mitigation system (VMS) to interrupt the VI pathway.

SUBSURFACE MITIGATION SYSTEM DESIGN & INSTALLATION

The 740 East Washington Street residence is depicted on **Figure 1**. The VMS utilizes two individual fans designed to mitigate the potential for chlorinated contaminant vapors in indoor air (IA) by introducing vacuum beneath the slab and exchanging the air in the crawlspace portion of the structure. This is accomplished using a series of blowers piped to vertical and horizontal extraction points throughout the building. The VMS was installed at the residence in April 2018.

Wilcox oversaw the installation of the VMS in general accordance with the Protect Environmental (Protect) Pilot Test evaluation from November 2016. The extraction pits (EPs) were installed by coring through the slab using a 5-inch, diamond-tipped, concrete coring bit. Protect removed approximately 10 gallons of gravel and soil from each EP to create void space around the end of the EP to facilitate the collection of vapors. The EPs are connected to 3-inch diameter polyvinyl chloride (PVC) conveyance piping and piped to exterior exhausting blowers. Each extraction point was equipped with Dwyer series 2-5000 Minihelic® differential pressure gauge to measure the inches of water column (in. w.c.) vacuum at each EP.

Two RadonAway® High Suction Series blowers (a GP-501 for the sub-slab portion and an RP-265 for the crawlspace air exchange portion) were selected for the VMS. The blower's electrical connection was made by connecting each blower to an electrical sub-meter connected to one of the main electrical panels within the building. System design schematics are provided in Protect Environmental's *Vapor Mitigation System Installation Report* included in **Appendix A**.

SYSTEM OPERATION AND MAINTENANCE

Annual system inspections are recommended by IDEM to ensure the VMS is operating as designed. The VMS will be operated in accordance with this OMM until it is determined that the subsurface contaminant levels have been reduced by attenuation and/or remediation and the VI pathway is incomplete. This site-specific OMM Plan has been developed in accordance with Schedule 1 from Table 3 of the IDEM *Vapor Remedy Selection and Implementation* guidance document and specifies the requirements for and frequency of VMS inspection and VI sampling based on the current level of risk.

A 40-hour OSHA HAZWOPER trained technician will perform the initial post mitigation and IA sampling which will include the following:

- Annual visual inspections of the building to identify significant changes such as remodeled areas, or additions to the building;
- Annual visual inspections of the VMS, in particular the pressure of the sub-slab port and the manometer to evaluate system operation; and,
- Annual IA sampling during the winter worst-case season during the first, second, and fifth year, and every fifth year thereafter.

The post-installation indoor air analytical results indicate that the VMS system is operating as designed and VI has been adequately mitigated. The vacuum readings collected from the sub-slab vapor pins and the magnehelic vacuum gauges installed at the EP will be used as a baseline to determine the effectiveness of the VMS system. Should it be supported by the data collected, a multiple lines of evidence justification for discontinuing indoor air sampling after the second winter indoor air sampling event will be compiled and submitted to IDEM to demonstrate that the potential for VI is sufficiently mitigated by the VMS.

The following table depicts the near-term schedule:

Year	2020	2021	2022	2023	2024	2025
Indoor Air Sampling	X	X			X	
PFE Monitoring	X	X	X	X	X	X

Wilcox staff will visually inspect the system during each scheduled visit. In the event the VMS or EPs are damaged or in need of maintenance, Wilcox staff will service the VMS and return it to normal operating condition.

RECORD KEEPING AND REPORTING

Inspection, maintenance, and repair records will be kept by the property owner, or by Wilcox on their behalf, until the system is approved for decommissioning. An example monitoring log is provided in **Appendix B.** IDEM reporting is not necessary unless there is a system failure or decommissioning; however, Wilcox will prepare an annual report documenting pressure tests and any maintenance or repairs conducted.

SYSTEM CLOSURE AND DECOMMISSIONING

The VMS must operate until IDEM determines there is no unacceptable risk to human health via the VI exposure pathway. According to the IDEM vapor guidance document, VMS termination sampling is based on the results of IA and sub-slab vapor sampling. In this scenario, the VMS will be shut down for at least 30 days prior to sampling during the worst-case winter heating season. The results of the sampling will be compared to applicable screening levels and Table 1 of the IDEM vapor guidance document.

Per IDEM guidance, the property owner may elect to continue operation of the VMS after the remediation objectives have been reached.

LIMITATIONS STATEMENT

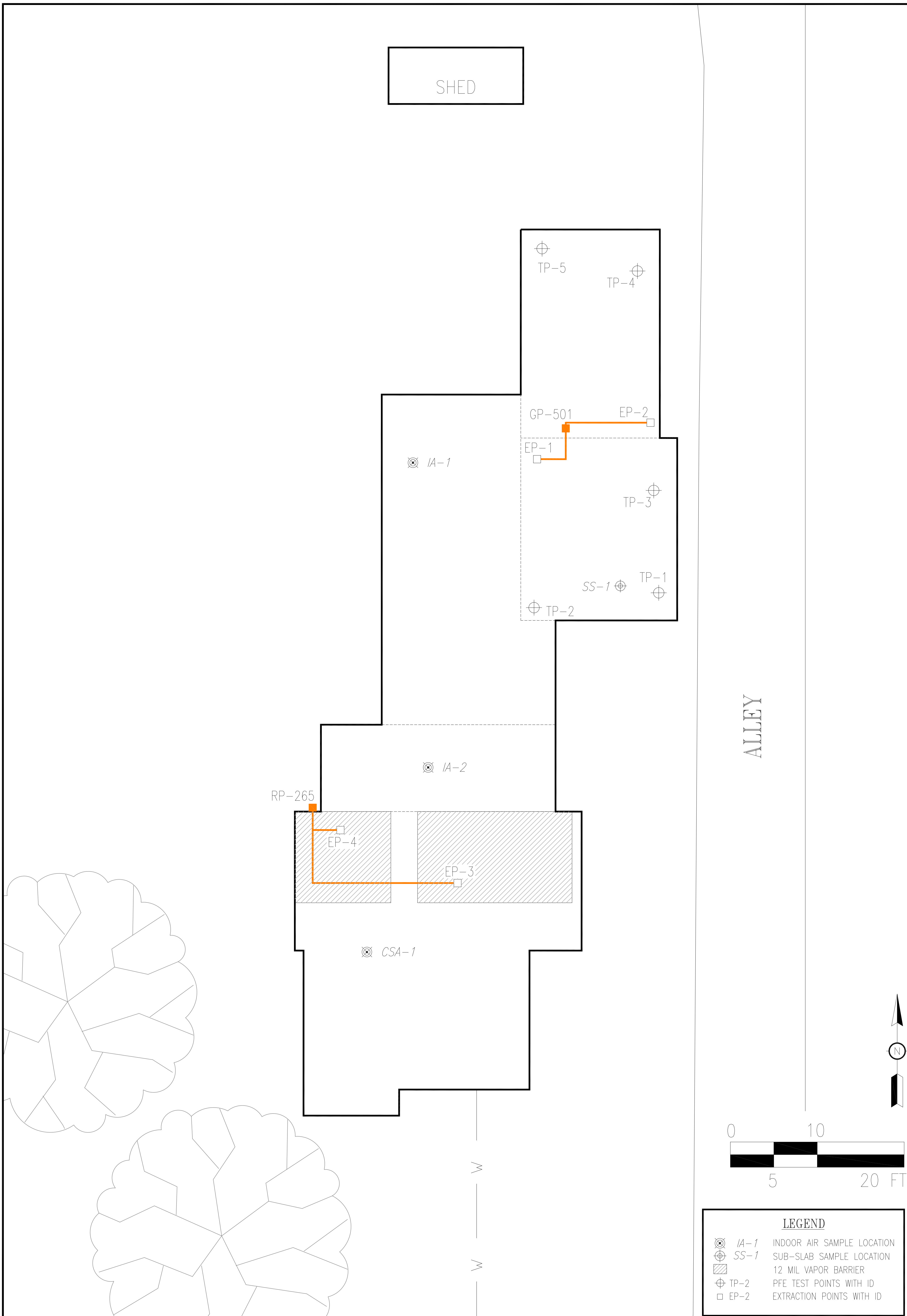
Wilcox Environmental Engineering, Inc.'s (Wilcox's) services, data, opinions, and recommendations described in this report are for Client's sole and exclusive use, and the unauthorized use of or reliance on the data, opinions, or recommendations expressed herein by parties other than Wilcox's Client is prohibited without Wilcox's express written consent. The services described herein are limited to the specific project, property, and dates of Wilcox's work. No part of Wilcox's report shall be relied upon by any party to represent conditions at other times or properties. Wilcox will accept no responsibility for damages suffered by third parties as a result of reliance upon the data, opinions, or recommendations in this report.

Wilcox's services are subject to all limitations, qualifications, and indemnifications enumerated in the terms and conditions or contract governing the work. Wilcox's findings, interpretations, opinions, and recommendations are probabilities based on Wilcox's professional judgment of Site conditions as discernible from the limited, and often indirect, information provided by others, information available to us at the time we performed our work, or information observed or developed by Wilcox using the methods specified in the scope of work. Wilcox does not warrant the accuracy, completeness, or validity of information and independent opinions, conclusions, and recommendations provided or developed by others, nor does Wilcox assume any responsibility for documenting or reporting conditions detectable with methods or techniques not specified in the scope of work. Maps and drawings in this report are included only to aid the reader and should not be considered surveys or engineering studies. The investigation described in this report was also conducted within the context of agency rules, regulations, action levels, and enforcement policies in effect at the time Wilcox performed its work. Later changes in agency rules, regulations, action levels, or policies may result in different conclusions than those expressed in this report.

Wilcox has striven to perform the services in a manner consistent with that level of care and skill ordinarily exercised by other environmental consultants practicing in the same locality and under similar conditions existing at the time we performed our services. **No other warranty is either expressed or implied in this report or any other document generated in the course of performing Wilcox's services.**

FIGURE

Figure 1: Vapor Mitigation System



WILCOX ENVIRONMENTAL ENGINEERING

VAPOR MITIGATION SYSTEM
740 EAST WASHINGTON STREET

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT #	341.14	SCALE	1" = 10'
PROJECT MANAGER	J. KINMAN	DATE	09/11/18
FILE NO.	34114001A	FIGURE NO.	1

APPENDIX A

Protect Environmental Vapor Mitigation System Installation Report

PROTECT™
ENVIRONMENTAL

Vapor Mitigation System Installation Report

Project location:

Residential Property

740 East Washington Street

Martinsville, IN

Prepared by:

Christopher Ferguson

Protect Environmental

Report Date:

August 20, 2018

Prepared by:

Christopher Ferguson
Protect Environmental
9822 Bluegrass Parkway
Louisville, KY 40299
Phone: 502-410-5000
Email: Christopher@ProtectEnv.com

Preparation Date: August 20, 2018

This report was developed specifically for the vapor intrusion mitigation system installation conducted at the Residential property located at 740 East Washington Street, Martinsville, IN (Site). The work was conducted in accordance with generally accepted industry practices and the American National Standards Institute (ANSI) document *Radon Mitigation Standards for Low Rise Residential Buildings (ANSI/AARST SGM-SF 2017)* under the supervision of Kyle Hoylman, a mitigation professional certified by the National Radon Proficiency Program (NRPP) and licensed by the Indiana State Department of Health.

Christopher Ferguson, CHMM	Kyle Hoylman
Project Manager	Mitigation Professional
CHMM #19682	NRPP #104372RMT
NRPP #109575RMT	IN Mitigation License: RTP00457

Contents

Figures

Appendices

Section 1.0: Introduction and Summary

Protect Environmental was engaged to design and install the mitigation systems for the residential property located at 740 East Washington Street in Martinsville, IN. The mitigation systems were installed in accordance with the ANSI document *Radon Mitigation Standards for Low Rise Residential Buildings (ANSI/AARST SGM-SF 2017)* under the supervision of Kyle Hoylman, a mitigation professional certified by the National Radon Proficiency Program (NRPP) and licensed by the Indiana State Department of Health.

Section 2.0: Scope of Work

The scope of work included:

1. Conducting an initial planning meeting with the client to review the project scope, information necessary to build the pilot test project plan, and on-site logistics;

2. Performance of a Pilot Test for the residential structure and development a mitigation system design;

3. Installation and pressure field extension (PFE) testing of the mitigation systems;

4. Preparation and submittal of a written mitigation system and post-mitigation cVI assessment report to the client.

The Pilot Test was conducted in November 2017, and the mitigation was completed in April 2018.

Section 3.0: Mitigation System Design and Installation

Based on the results of the pilot test and building evaluation, Protect mobilized to the Site in April 2018 to conduct the mitigation system installations. A total of two mitigation systems were installed in the Residential building: a Sub-slab depressurization (SSD) system on the slab section of the building and a Sub-membrane depressurization (SMD) system in the crawlspace area of the building. The specific construction details of each system are described below.

SSD Mitigation System Design

One SSD mitigation system was installed in the building. The as-built design is included in Figure #1 attached. The design for each of the installed systems is as follows:

SSD System: Installed approximately fifty feet (50') of three-inch (3") SCH40 PVC conveyance pipe, routing through two (2) interior wall transition points via two (2) five-inch (5") vertical sub-slab suction points; installed one (1) blower capable of delivering up to 4.2-inches (4.2") w.g. pressure in the building attic; installed one three-inch (3") Kozy Kollar; installed two (2) rubber couplings; installed one (1) electric switch within line-of-site of blower, routing from a new electrical circuit installed on the existing power supply of the building; installed two (2) pressure differential monitoring devices; installed system labels.

SMD Mitigation System Design

One SMD mitigation system was installed in the building. The as-built design is included in Figure #1 attached. The design for each of the installed systems is as follows:

SSD System: Installed approximately fifty feet (50') of four-inch (4") SCH40 PVC conveyance pipe, routing through one (1) exterior wall transition point via two (2) four-inch (4") vertical membrane suction points; installed approximately seven-hundred square feet (700ft^2) of 12-mil vapor barrier, mechanically fastened to the brick and block walls and sealed with a low-VOC caulk; installed one (1) blower capable of delivering up to 2.5-inches (2.5") w.g. pressure on the building exterior; installed two (2) rubber couplings; installed one (1) electric switch with waterproof cover within line-of-site of blower, routing from a new electrical circuit installed on the existing power supply of the building; installed two (2) pressure differential monitoring devices; installed system labels.

Section 4.0: Post-Mitigation PFE Evaluation

The post-mitigation PFE evaluation was conducted as part of the installation event. Based on the results of the PFE evaluation, the mitigation systems are inducing negative sub-slab pressure differential throughout the mitigated areas of the building. The results of the post-mitigation PFE evaluation are tabulated below:

Table 1: Post-Mitigation Sub-slab PFE Results

System	Test Point	Date	Subslab PFE Measurement
VMS-01	TP-01	4/13/2018	-0.054
	TP-02	4/13/2018	-0.071
	TP-03	4/13/2018	-0.060
	TP-04	4/13/2018	-0.064
	TP-05	4/13/2018	-0.039

Table 2: System Information

System	System Type	Suction Point	Pressure Reading	Installation Date	Serial Number
VMS-01	GP-501	SP-01	1.2	4/13/2018	115315
		SP-02	1.2		
VMS-02	RP-265	SP-03	2.0	4/13/2018	118860
		SP-04	2.1		

Section 5.0: Post-Mitigation Indoor Air Testing

The post-mitigation indoor air and sub-slab testing event was conducted by Wilcox Environmental. Based on the communication with Wilcox, the post-mitigation indoor air results were below the Indiana Department of Environmental Management (IDEM) Residential Screening Criteria.

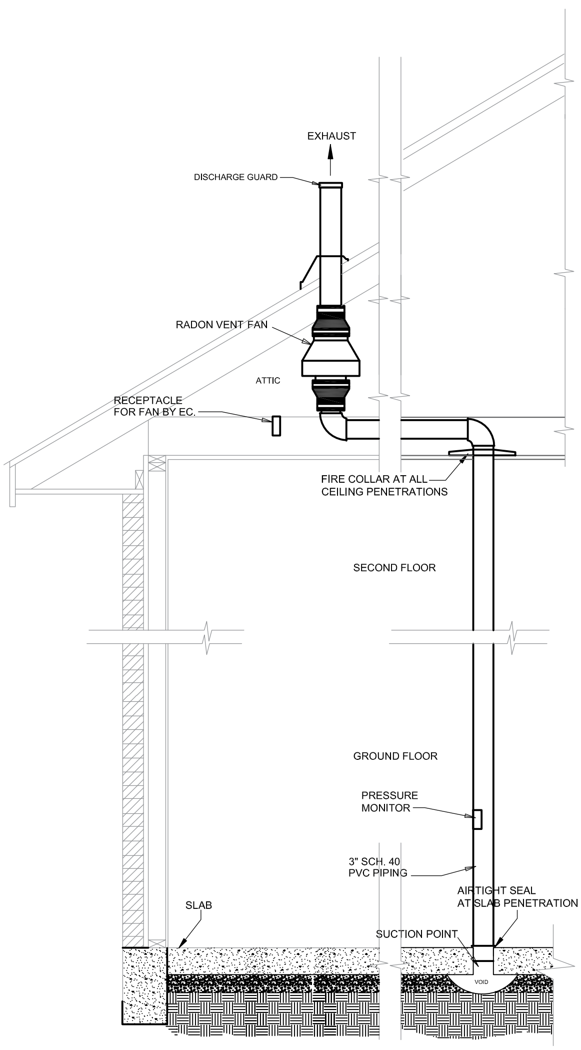
Section 6.0: Conclusions

The sole purpose of this report is to provide the client with information regarding the conditions that existed at the property at the time of the mitigation/remediation system installations and the post-mitigation/remediation indoor air testing. An uncertainty with any result due to statistical variations and other factors such as daily and seasonal variations in contaminant of concern concentrations does exist. Variations may be due to changes in weather conditions, environmental influence or building conditions and usage. The conclusions contained within this report are derived from information obtained from the client and the onsite activities conducted under the scope of work performed. This report was prepared solely for the use of the client. Use of this report by any party other than the client is prohibited without prior written consent from Protect Environmental.

Based on the results of the post-mitigation testing, active soil depressurization has been shown to be a viable mitigation technology for the Site.

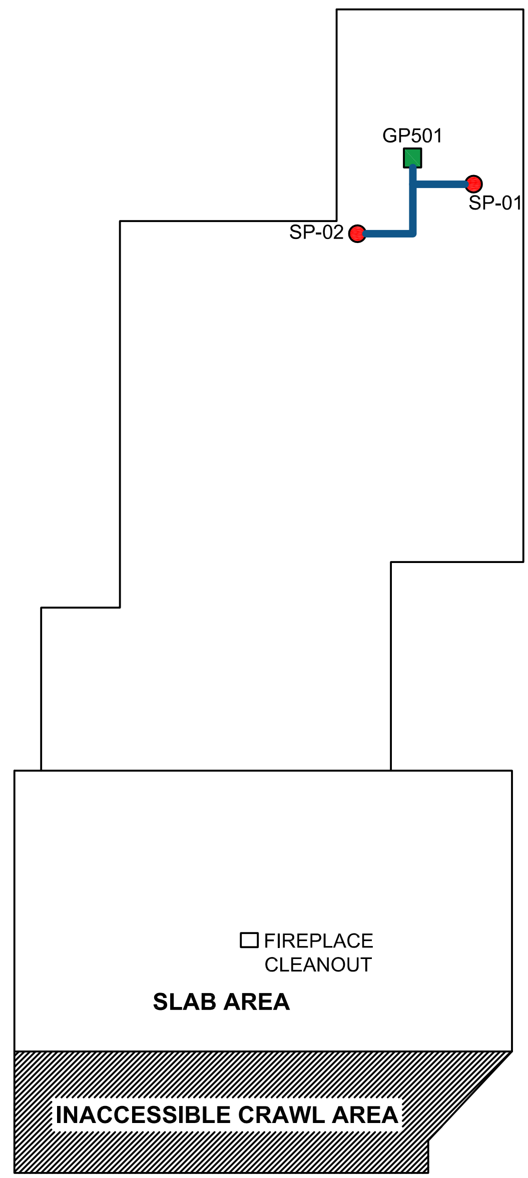
Figure 1:

As-Built Mitigation System Design – System #1



INTERIOR ACTIVE MITIGATION SYSTEM DETAIL (TYPICAL)

SCHEMATIC - NO SCALE



SYSTEM 1 DESIGN

NO SCALE

These plans depict the details of an active radon mitigation system design. The design has been developed in accordance with the reference standard, *Soil Gas Mitigation Standards for Existing Homes (ANSI/AARST SGM-SF 2017)*, under the direct supervision of a Qualified Radon Professional. The design may be modified by Protect Environmental, as necessary, to address property conditions and construction restraints. All work must be conducted in accordance with the Project Specifications under the direct supervision of a Qualified Radon Professional.

PROTECT ENVIRONMENTAL

9822 BLUEGRASS PKWY
LOUISVILLE, KY 40299
PHONE: 502-410-8850
TOLL FREE: 877-508-8850

LEGEND:

- **SUCTION POINT LOCATION**
- **VENT FAN**
- **3" HORIZONTAL CONVEYANCE PIPE**

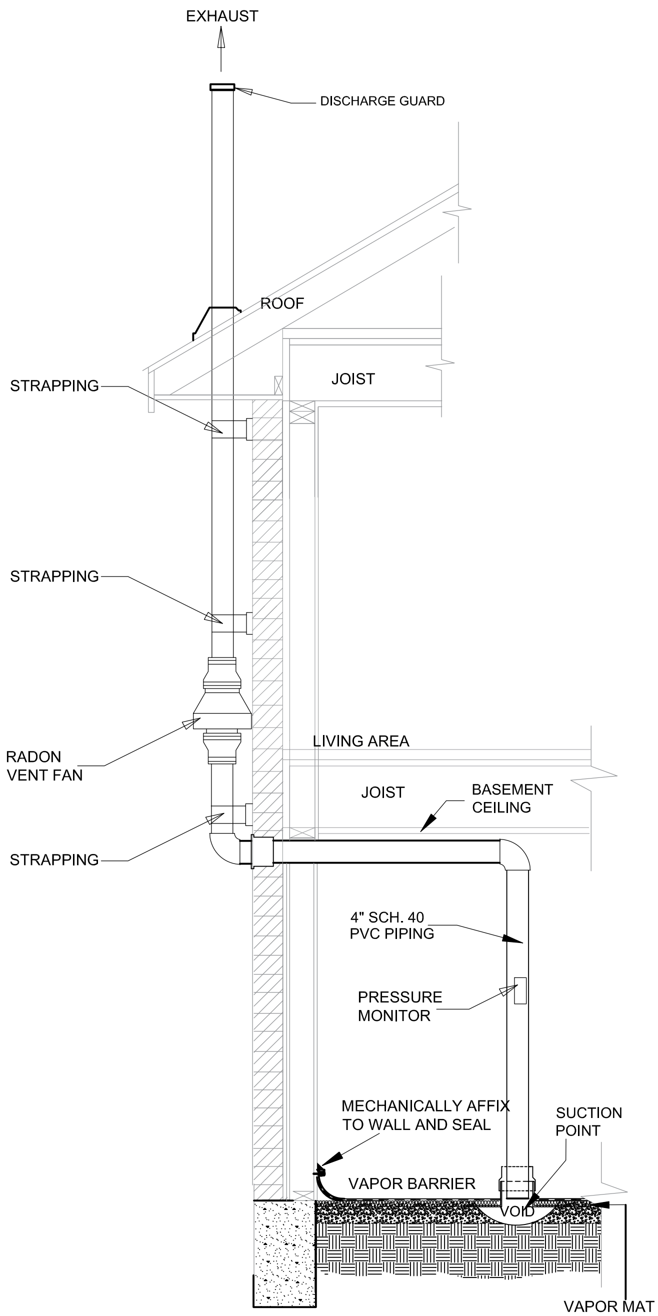
740 East Washington Street
Martinsville, IN

DRAWING DATE
8/09/2018

SHEET
MD1.1

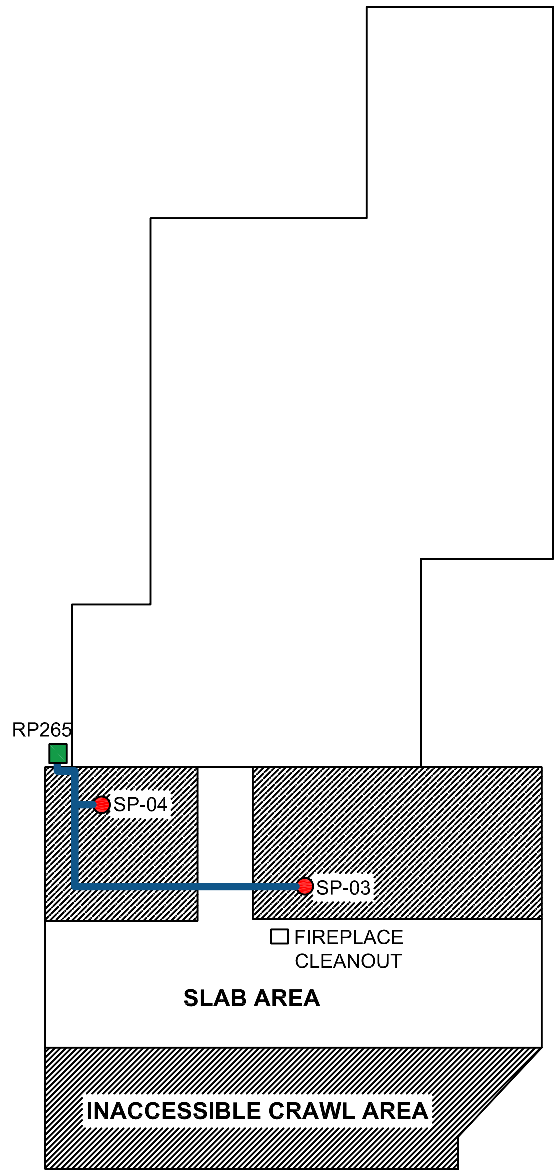
Figure 2:

As-Built Mitigation System Design – System #2



EXTERIOR ACTIVE MITIGATION SYSTEM DETAIL (TYPICAL)

SCHEMATIC - NO SCALE



SYSTEM 2 DESIGN

NO SCALE

These plans depict the details of an active radon mitigation system design. The design has been developed in accordance with the reference standard, *Soil Gas Mitigation Standards for Existing Homes (ANSI/AARST SGM-SF 2017)*, under the direct supervision of a Qualified Radon Professional. The design may be modified by Protect Environmental, as necessary, to address property conditions and construction restraints. All work must be conducted in accordance with the Project Specifications under the direct supervision of a Qualified Radon Professional.

PROTECT ENVIRONMENTAL

9822 BLUEGRASS PKWY
LOUISVILLE, KY 40299
PHONE: 502-410-8850
TOLL FREE: 877-508-8850

LEGEND:

- SUCTION POINT LOCATION
- VENT FAN
- 4" HORIZONTAL CONVEYANCE PIPE
- 12-MIL VAPOR BARRIER

740 East Washington Street
Martinsville, IN

DRAWING DATE 8/09/2018

SHEET MD1.2

Appendix A:

RP-265 Model Blower Specifications

RadonAway®

The world's leading radon fan manufacturer

RP / RPc Series
Installation Instructions

RadonAway®

Fan Installation & Operating Instructions
Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN “OFF” POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI Applications. See RadonAway.com/vapor-intrusion.

2. **NOTE:** Fan is suitable for use with solid state speed controls; however, use of speed controls is not generally recommended.

2. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

3. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

4. **NOTICE!** There are no user serviceable parts located inside the fan unit. **Do NOT attempt to open.** Return unit to the factory for service.

5. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

6. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

   c) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.

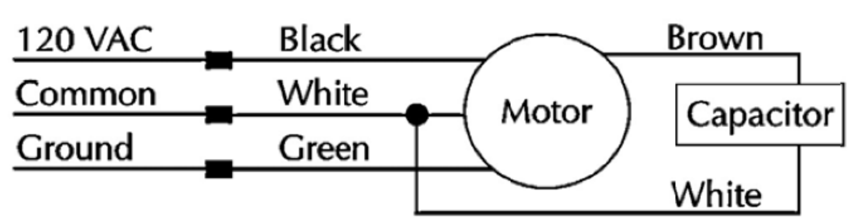
   d) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturers’ guidelines and safety standards such as those published by any National Fire Protection Association, and the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), and the local code authorities.

   e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

   f) Ducted fans must always be vented to outdoors.

   g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) protected branch circuit.

RP Series Fan Wiring Diagram



RadonAway®

Fan Installation & Operating Instructions

Fan Series

RP140 | P/N 28460
RP145 | P/N 28461
RP260 | P/N 28462
RP265 | P/N 28463
RP380 | P/N 28464

RP140c | P/N 23029-1
RP145c | P/N 23030-1
RP260c | P/N 23032-1
RP265c | P/N 23033-1

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The RP / RPc Series Radon Fans are intended for use by trained, professional, certified/licensed radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of an RP / RPC Series Fans. These instructions should be considered supplemental to EPA/radon industry standard practices, state and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 FAN SEALING

The RP / RPc Series Fans are factory sealed; no additional caulk or other materials are required to inhibit air leakage.

1.3 ENVIRONMENTALS

The RP / RPc Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F or more than 100 degrees F.

1.4 ACOUSTICS

The RP / RPc Series Fans, when installed properly, operate with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

[To ensure quiet operation of inline and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan(s). RP / RPc Series Fans are not suitable for kitchen range hood remote ventilation applications.]

1.5 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes, thus blocking air flow to the RP / RPc Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes, allowing for return to normal operation.

1.6 SLAB COVERAGE

The RP / RPc Series Fans can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP / RPc Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/140c and RP145/145c are best suited for general purpose use. The RP260/260c can be used where additional airflow is required, and the RP265/265c and RP380 are best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP / RPc Series Fan MUST be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP / RPc Series Fans are NOT suitable for underground burial.

For RP / RPc Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Diameter	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6”	-	3/16	1/4	3/8	3/4
4”	1/8	1/4	3/8	2 3/8	-
3”	1/4	3/8	1 1/2	-	-

*Typical RP/RPc (except RP380/RP380c) Series Fan operational flow rate is 25 - 90 CFM on 3” and 4” pipe.(For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

1.8 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2, 28001-4 or 28421), should be provided and is required to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 50017) with instructions for contacting the installing contractor for service and identifying the necessity for regular radon tests to be conducted by the building occupants must be conspicuously placed in a location where the occupants frequent and can see the label.

1.9 VENTILATION

If used as a ventilation fan, any type of ducting is acceptable; however, flexible nonmetallic ducting is recommended for easy installation and quieter operation. Insulated flexible ducting is highly recommended in cold climates to prevent the warm bathroom air, for example, from forming condensation in the ducting where it is exposed to colder attic air. The outlet of the fan should always be ducted to the outside. Avoid venting the outlet of the fan directly into an attic area. The excess moisture from the bathroom can cause damage to building structure and any items stored in the attic. Multiple venting points may be connected together using a “T” or “Y” fitting. Ideally, the duct should be arranged such that equal duct lengths are used between intake and “T” or “Y” fitting; this will result in equal flow rates in each intake branch. If adjustable intake grilles are used on multi-intake systems, then the opening on each grille should be equal in order to minimize noise and resistance. Straight smooth runs of rigid metal ducting will present the least resistance and maximize system performance. The Equivalent Length of Rigid Metal Ducting resulting in .2”WC pressure loss for each Fan Model is provided in the Specifications section of these instructions. Flexible ducting, if used, must always be as close to being fully extended as possible. Formed rigid metal duct elbows will present the least resistance and maximize system performance; recommended bend radius of elbow is at least 1.5 x duct diameter.

RP / RPc Series fans are not suitable for kitchen range hood remote ventilation applications. For quietest performance, the fan should be mounted farther away from the inlet duct, near the outside vent. A minimum distance of 8 feet is recommended between the fan or T/Y of a multi-intake system and intake grille(s).

Backdraft dampers allow airflow in only one direction, preventing cold/hot draughts from entering the vented area and minimizing possible condensation and icing within the system while the fan is not operating. Backdraft dampers are highly recommended at each intake grille for bathroom ventilation in all cold climate installations. Installation instructions are included with Spruce backdraft dampers.

1.10 ELECTRICAL WIRING

The RP / RPc Series Fans operate on standard 120V, 60Hz AC. All wiring must be performed in accordance with National Fire Protection (NFPA) National Electrical Code, Standard #70, current edition, for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a UL Listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.11 SPEED CONTROLS

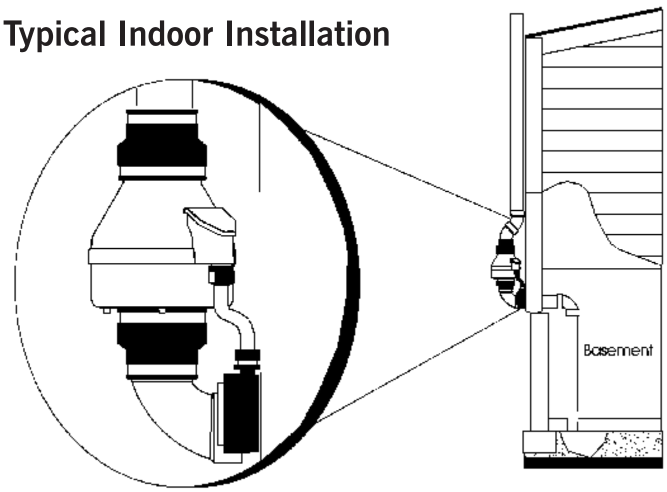
The RP / RPc Series Fans are rated for use with electronic speed controls; however, speed controls are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control.

2.0 INSTALLATION

The RP / RPc Series Fans can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.) The RP / RPc Series Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.

For the ENERGY STAR Labeled RP140 / RP140c , the ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

Typical Indoor Installation



2.1 MOUNTING

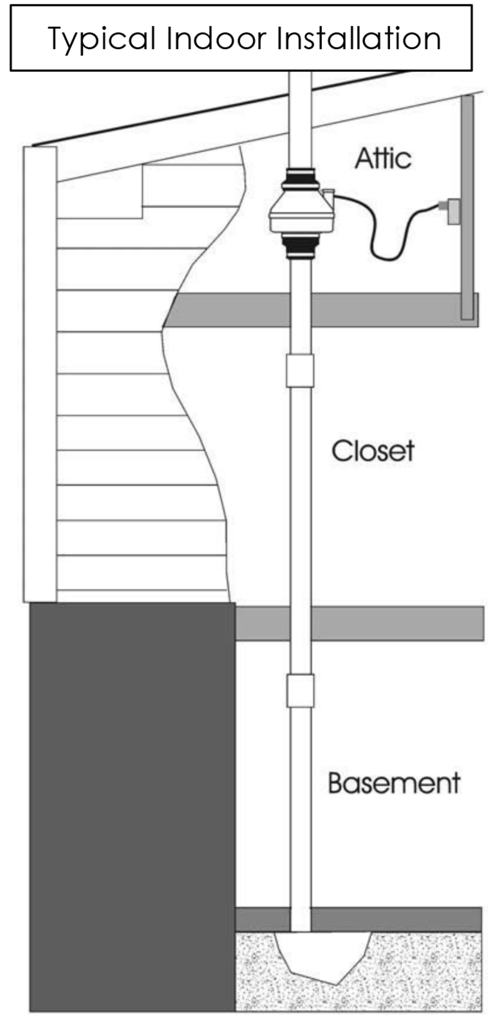
Mount the RP / RPc Series Fan vertically with outlet up. Ensure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

The RP / RPc Series Fan may be optionally secured with the RadonAway mounting bracket (P/N 25007 or 25033 for RP380 only). Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.



2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.10). Note that the fan is not intended for connection to rigid metal conduit.

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

______ **Verify** all connections are tight and **leak-free**.

______ **Ensure** the RP / RPc Series Fan and all ducting are **secure and vibration-free**.

______ **Verify system vacuum pressure** with manometer. **Ensure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.
(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

______ **Verify Radon levels** by testing to EPA Protocol and applicable testing standards.

RP / RPc Series Product Specifications

The following chart shows fan preformance for the RP / RPc Series Fans:

Typical CFM Vs. Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140/140c	135	103	70	14	-	-	-	-	
RP145/145c	166	146	126	104	82	61	41	21	3
RP260/260c	251	209	157	117	70	26	-	-	-
RP265/265c	334	291	247	210	176	142	116	87	52
RP380	531	490	415	340	268	200	139	84	41

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
RP140/140c	15 - 21 watts	0.7" WC
RP145/145c	41 - 72 watts	1.7" WC
RP260/260c	47-65 watts	1.4" WC
RP265/265c	91 - 129 watts	2.2" WC
RP380	96 - 138 watts	2.2" WC

**Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 ft. of altitude.*

Model	Size	Weight	Inlet/Outlet	L.2
RP140/140c	8.5"H x 9.7" Dia.	5.5 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)	25
RP145/145c	8.5"H x 9.7" Dia.	5.5 lbs	4,5" OD	15
RP260/260c	8.6"H x 11.75" Dia.	5.5 lbs	6.0" OD	48
RP265/265c	8.6"H x 11.75" Dia.	6.5 lbs	6.0" OD	30
RP380	10.53"H x 13.41" Dia.	11.5 lbs	8.0" OD	57

L.2 = Estimated Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for Duct Size listed. Longer Equivalent Lengths can be accommodated at Flows Lower than that at .2" WC pressure loss (see CFM Vs Static Pressure "WC Table).

Recommended Ducting: RP/RPc Series Fans (excluding RP380), 3" or 4" Schedule 20/40 PVC Pipe;
RP380, 6" Schedule 20/40 PVC Pipe

PVC Pipe Mounting: If used for Ventilation, use 4", 6" or 8" Rigid or Flexible Ducting.
Mount on the duct pipe or with optional mounting bracket.

Storage Temperature Range: 32-100 degrees F

Thermal Cutout:

RP140/140c	130^{o}C (266^{o}F)
RP145/145c	150^{o}C (302^{o}F)
RP260/260c	150^{o}C (302^{o}F)
RP265/265c	150^{o}C (302^{o}F)
RP380	150^{o}C (302^{o}F))

Continuous Duty

Class F Insulation (RP140/RP140c Class B)

Thermally Protected Auto Reset

3000 RPM

Rated for Indoor or Outdoor Use

LISTED
Electric Fan

Intertek
77728

Conforms to
UL STD. 507
Certified to
CAN/CSA STD.
C22.2 No.113

ENERGY STAR
RP140 Only

2100 HVI CERTIFIED

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the RadonAway® RP/RPc, GP/GPc, XR/XRc, XP/XPc, XR and SF Series Fan for shipping damage within 15 days of receipt. **Notify RadonAway of any damages immediately.** RadonAway is not responsible for damages incurred during shipping. However, for your benefit, RadonAway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open the housing.** Return unit to factory for service.

Install the RP/RPc, GP/GPc, XP/XPc, XR and SF Series Fan in accordance with all EPA, ANSI/AARST standard practices, and state and local building codes and regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

Warranty

RadonAway® warrants that the RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR, SF Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner (the "Warranty Term").

RadonAway® will replace any fan which fails due to defects in materials or workmanship during the Warranty Term. This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway®.

The Fan must be returned (at Owner's cost) to the RadonAway® factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

5-YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway® will extend the Warranty Term of the fan to 60 months (5 years) from date of purchase or 66 months from date of manufacture, whichever is sooner, provided that the fan is installed by a professional radon mitigation contractor. Proof of purchase and/or proof of professional installation may be required for service under this warranty. No extended warranty is offered outside the Continental United States and Canada beyond the standard 12 months from the date of purchase or 18 months from the date of manufacture, whichever is sooner.

RadonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR, SF SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping costs, including insurance, to and from factory.

RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

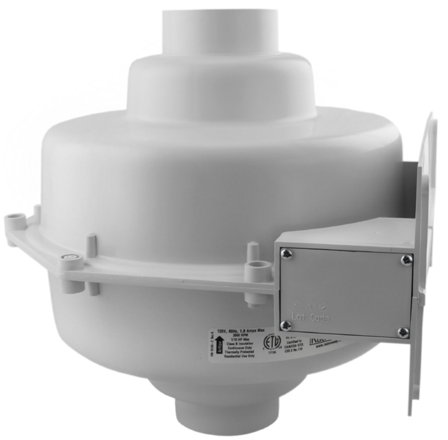
Record the following information for your records:

Serial Number: ______________________ Purchase Date: ______________

Appendix B:

GP-501 Model Blower Specifications

The world's leading radon fan manufacturer



GP/GPc, XP/XPc, XR Series Installation Instructions

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** For General Ventilating Use Only. Do Not Use to Exhaust Hazardous, Corrosive or Explosive Materials, Gases or Vapors. See Vapor Intrusion Application Note #AN001 for important information on VI Applications. RadonAway.com/vapor-intrusion

2. **NOTE:** Fan is suitable for use with solid state speed controls; however, use of speed controls is not generally recommended.

2. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

3. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

4. **NOTICE!** There are no user serviceable parts located inside the fan unit.
Do NOT attempt to open. Return unit to the factory for service.

5. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

6. **WARNING!** TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:

   a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.

   b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

   c) Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.

   d) Sufficient air is needed for proper combustion and exhausting of gases through the flue (chimney) of fuel burning equipment to prevent backdrafting. Follow the heating equipment manufacturers' guidelines and safety standards such as those published by any National Fire Protection Association, and the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), and the local code authorities.

   e) When cutting or drilling into a wall or ceiling, do not damage electrical wiring and other hidden utilities.

   f) Ducted fans must always be vented to outdoors.

   g) If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application and be connected to a GFCI (Ground Fault Circuit Interrupter) protected branch circuit.

RadonAway

Fan Installation & Operating Instructions

XP/XPc/XR Fan Series	GP/GPc Fan Series
XP151 | P/N 28469	GP201 | P/N 28465
XP201 | P/N 28470	GP301 | P/N 28466
XP201c | P/N 23011-1	GP301c | P/N 23006-1
XR261 | P/N 28471	GP401 | P/N 28467
	GP501 | P/N 28468
	GP501c | P/N 23005-1

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The GP/GPc, XP/XPc and XR Series Radon Fans are intended for use by trained, professional, certified/licensed radon mitigators. The purpose of these instructions is to provide additional guidance for the most effective use of GP/GPc, XP/XPc and XR Series Fans. These instructions should be considered supplemental to EPA/radon industry standard practices, state and local building codes and regulations. In the event of a conflict, those codes, practices and regulations take precedence over these instructions.

1.2 FAN SEALING

The GP/GPc, XP/XPc and XR Series Fans are factory sealed; no additional caulk or other materials are required to inhibit air leakage.

1.3 ENVIRONMENTALS

The GP/GPc, XP/XPc and XR Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F or more than 100 degrees F.

1.4 ACOUSTICS

The GP/GPc, XP/XPc and XR Series Fans, when installed properly, operate with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

(To ensure quiet operation of inline and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan(s). GP/GPc, XP/XPc and XR Series Fans are not suitable for kitchen range hood remote ventilation applications.)

1.5 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes, thus blocking air flow to the GP/GPc, XP/XPc and XR Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes, allowing for return to normal operation.

1.6 SLAB COVERAGE

The GP/GPc, XP/XPc and XR Series Fans can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/GPc, XP/XPc and XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP/GPc and XP/XPc Series have a wide range of models to choose from to cover a wide range of sub-slab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drainage tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.7 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GP/GPc, XP/XPc and XR Series Fan MUST be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/GPc, XP/XPc and XR Series Fans are NOT suitable for underground burial.

For GP/GPc, XP/XPc and XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Diameter	Minimum Rise per Ft of Run*		
	@25 CFM	@50 CFM	@100 CFM
4”	1/8”	1/4”	3/8”
3”	1/4”	3/8”	1 1/2”

*Typical GP/GPc, XP/XPc and XR Series Fan operational flow rate is 25 - 90 CFM. (For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

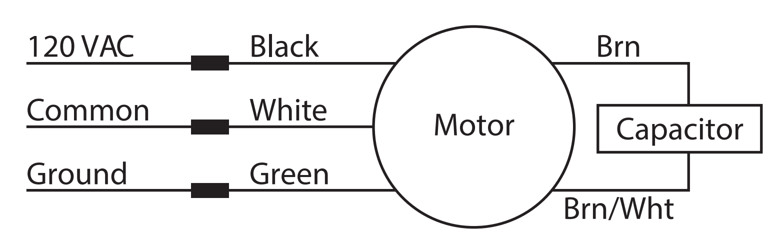
1.8 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50017) or audible alarm (P/N 28001-2, 28001-4 or 28421), is required to notify the occupants of a fan system malfunction. A System Label (provided with Manometer P/N 50017) with instructions for contacting the installing contractor for service and identifying the necessity for regular radon tests to be conducted by the building occupants must be conspicuously placed in a location where the occupants frequent and can see the label.

1.8 ELECTRICAL WIRING

The GP/GPc, XP/XPc and XR Series Fans operate on standard 120V, 60Hz AC. All wiring must be performed in accordance with National Fire Protection (NFPA) National Electrical Code, Standard #70, current edition, for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a UL Listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

GP/GPc XP/XPc XR Series Fan Wiring Diagram

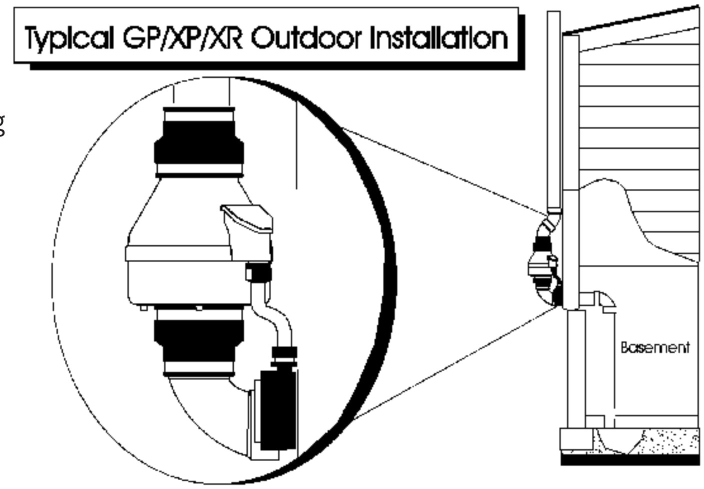


1.9 SPEED CONTROLS

The GP/GPc, XP/XPc and XR Series Fans are rated for use with electronic speed controls; however, speed controls are generally not recommended. If used, the recommended speed control is Pass & Seymour Solid State Speed Control (Cat. No. 94601-1).

2.0 INSTALLATION

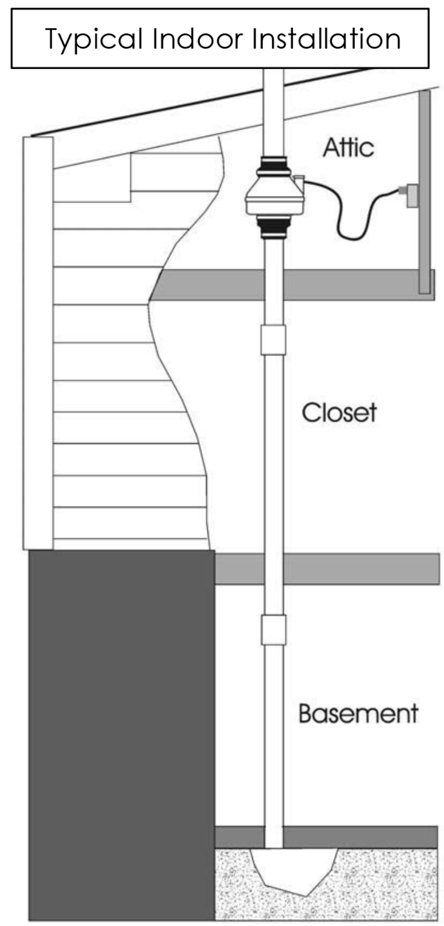
The GP/GPc, XP/XPc and XR Series Fans can be mounted indoors or outdoors. (It is suggested that EPA and radon mitigation standards recommendations be followed in choosing the fan location.) The GP/GPc fans have an integrated mounting bracket; XP/XPc and XR Series Fans may be mounted directly on the system piping or fastened to a supporting structure by means of an optional mounting bracket.



The ducting from the fan to the outside of the building has a strong effect on noise and fan energy use. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated airflow.

2.1 MOUNTING

Mount the GP/GPc, XP/XPc and XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.



2.2 MOUNTING BRACKET (optional)

The XP/XPc and XR Series Fans may be optionally secured with the RadonAway P/N 25007 mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as a means of disconnect for servicing the unit and for vibration isolation. As the fan is typically outside of the building thermal boundary and is venting to the outside, installation of insulation around the fan is not required.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8).
Note that the fan is not intended for connection to rigid metal conduit.

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting.
Solvent weld all connections.
The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS & ANNUAL SYSTEM MAINTENANCE

______ **Verify** all connections are tight and **leak-free**.

______ **Ensure** the GP/GPc, XP/XPc and XR Series Fan and all ducting are **secure and vibration-free**.

______ **Verify system vacuum pressure** with manometer. **Insure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.
(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 feet)
(Further reduce Maximum Operating Pressure by 10% for High Temperature environments.)
See Product Specifications. If this is exceeded, increase the number of suction points.

______ **Verify Radon levels** by testing to EPA Protocol and applicable testing standards.

XP/XPc and XR Series Product Specifications

The following chart shows fan preformance for the XP/XPc and XR Series Fans:

Typical CFM Vs. Static Pressure "WC						
	0"	**.5"**	**1.0"**	**1.5"**	**1.75"**	**2.0"**
XP151	150	115	69	-	-	-
XP201/XP201c	112	95	70	40	-	-
XR261	217	149	87	27	-	-

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
XP151	45 - 60 watts	1.3" WC
XP201/XP201c	45 - 66 watts	1.7" WC
XR261	67 - 117 watts	1.6" WC

**Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 ft. of altitude.*

Model	Size	Weight	Inlet/Outlet
XP151	9.5"H x 8.5" Dia.	6 lbs	4.5"OD (4.0" PVC Sched 40 size compatible)
XP201/XP201c	9.5"H x 8.5" Dia.	6 lbs	4.5" OD
XR261	9.5"H x 8.5" Dia.	7 lbs	6" OD

XP/XPc Series Inlet/Outlet: 4.5" OD (4.0" PVC Sched 40 size compatible)
XR Series Inlet/Outlet: 6" OD
Size: 9.5H" x 8.5" Dia.
Weight: 6 lbs. (XR261 - 7 lbs)
Recommended Ducting: 3" or 4" Schedule 20/40 PVC Pipe
PVC Pipe Mounting: Fan may be mounted on the duct pipe or with integral flanges.
Storage Temperature Range: 32-100 degrees F
Thermal Cutout:

XP151	130^{o}C (266^{o}F)
XP201/201c	130^{o}C (266^{o}F)
XR261	130^{o}C (266^{o}F)

Continuous Duty
Thermally Protected
Class B Insulation
3000 RPM
Residential Use Only
Rated for Indoor or Outdoor Use

LISTED
Electric Fan

Intertek
77728

Conforms to
UL STD. 507

Certified to
CAN/CSA STD.
C22.2 No.113

GP/GPc Series Product Specifications

The following chart shows fan preformance for the GP/GPc Series Fans:

Typical CFM Vs. Static Pressure “WC							
	1.0”	**1.5”**	**2.0”**	**2.5”**	**3.0”**	**3.5”**	**4.0”**
GP201	54	42	11	-	-	-	-
GP301/GP301c	64	54	41	4	-	-	-
GP401	-	61	52	44	22	-	-
GP501/GP501c	-	-	66	58	50	27	4

Model	Power Consumption 120VAC, 60Hz, 1.5 Amp Maximum	Maximum Recommended Operation Pressure* (Sea Level Operation)**
GP201	31-65 watts	1.8” WC
GP301/GP301c	56-100 watts	2.3” WC
GP401	62-128 watts	3.0” WC
GP501/GP501c	68 - 146 watts	3.8” WC

**Reduce by 10% for High Temperature Operation **Reduce by 4% per 1000 ft. of altitude.*

Model	Size	Weight	Inlet/Outlet
GP201	13.5”H x 12.5” Dia.	12 lbs	3.5”OD (3.0” PVC Sched 40 size compatible)
GP301/GP301c	13.5”H x 12.5” Dia.	12 lbs	3.5” OD
GP401	13.5”H x 12.5” Dia.	12 lbs	3.5” OD
GP501/GP501c	13.5”H x 12.5” Dia.	12 lbs	3.5” OD

Inlet/Outlet: 3.5” OD (3.0” PVC Sched 40 size compatible)

Mounting: Fan may be mounted on the duct pipe or with integral flanges.

Weight: 12 lbs

Size: 13H” x 12.5” x 12.5”

Recommended Ducting: 3” or 4” Schedule 20/40 PVC Pipe

Storage Temperature Range: 32 - 100 degrees F

Thermal Cutout:

GP201	130°C (266°F)
GP301/301c	130°C (266°F)
GP401	130°C (266°F)
GP501/501c	130°C (266°F)

Continuous Duty

Class B Insulation

3000 RPM

Thermally Protected

Rated for Indoor or Outdoor Use

LISTED
Electric Fan

C US
Intertek
77728

Conforms to
UL STD. 507

Certified to
CAN/CSA STD.
C22.2 No.113

IMPORTANT INSTRUCTIONS TO INSTALLER

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RadonAway® is not responsible for installation, removal or delivery costs associated with this Warranty.

LIMITATION OF WARRANTY

EXCEPT AS STATED ABOVE, THE RP/RPc, GP/GPc (excluding GP500), XP/XPc, XR and SF SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULARPURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping costs, including insurance, to and from factory.

RadonAway® 3 Saber Way
Ward Hill, MA 01835 USA TEL (978) 521-3703
FAX (978) 521-3964
Email to: Returns@RadonAway.com

Record the following information for your records:

Serial Number: ________________________ Purchase Date: ________________

Appendix C:

Credential Documentation

December 12, 2016

Your Radon Mitigator license (number RTM00457) and reference card are enclosed.

ADDRESS CHANGE: It is your responsibility to notify the Indiana State Dept. of Health, Lead and Healthy Homes program, in writing of any address changes. Please provide your name, previous address, new address, zip code, license number, expiration date, home phone number, and work number in your correspondence.

NAME CHANGE: If you have a name change to report, you must provide the appropriate documentation - such as a copy of a marriage certificate, divorce decree, or court order. Please provide your name, previous address, new address, zip code, certificate number, expiration date, home phone number, and work number in your correspondence.

Send any Name and Address changes to Indiana State Department of Health, Lead and Healthy Homes, 2 N. Meridian Street, 5J, Indianapolis, IN 46204.

LICENSE RENEWAL: The Lead and Healthy Homes Program will forward a license renewal application to the licensee at the address provided to the Indiana State Department of Health for this license about sixty (60) days prior to expiration.

Indiana State Department of Health
Lead and Healthy Homes
100 N. Senate Avenue, N855
Indianapolis, IN 46204 (317) 234-4423

Radon Mitigator License

Certificate Number	Status	Expiration Date
RTM00457	Active	12/31/2018

Kyle E. Hoylman

STATE FORM 49122 (9-98)

Approved by State Board of Accounts 1999

Certificate Number	Status	Expiration Date
RTM00457	Active	12/31/2018

Indiana State Department of Health
Lead and Healthy Homes
2 N. Meridian Street, 5J
Indianapolis, Indiana 46204 (317) 234-4423

Radon Mitigator License

Certificate Number	Status	Expire Date
RTM00457	Active	12/31/2018

Kyle E. Hoylman

Jerome M. Adams, MD, MPH
State Health Commissioner
Indiana State Department of Health

REMOVE AT PERFORATION

STATE FORM 49122 (9-98)

December 12, 2016

Your Primary Radon Tester license (number RTP00457) and reference card are enclosed.

ADDRESS CHANGE: It is your responsibility to notify the Indiana State Dept. of Health, Lead and Healthy Homes program, in writing of any address changes. Please provide your name, previous address, new address, zip code, license number, expiration date, home phone number, and work number in your correspondence.

NAME CHANGE: If you have a name change to report, you must provide the appropriate documentation - such as a copy of a marriage certificate, divorce decree, or court order. Please provide your name, previous address, new address, zip code, certificate number, expiration date, home phone number, and work number in your correspondence.

Send any Name and Address changes to Indiana State Department of Health, Lead and Healthy Homes, 2 N. Meridian Street, 5J, Indianapolis, IN 46204.

LICENSE RENEWAL: The Lead and Healthy Homes Program will forward a license renewal application to the licensee at the address provided to the Indiana State Department of Health for this license about sixty (60) days prior to expiration.

Indiana State Department of Health
Lead and Healthy Homes
100 N. Senate Avenue, N855
Indianapolis, IN 46204 (317) 234-4423

Primary Radon Tester License

Certificate Number	Status	Expiration Date
RTP00457	Active	12/31/2018

Kyle E. Hoylman

STATE FORM 49122 (9-98)

Approved by
State Board of
Accounts 1999

Certificate Number	Status	Expiration Date
RTP00457	Active	12/31/2018

Indiana State Department of Health
Lead and Healthy Homes
2 N. Meridian Street, 5J
Indianapolis, Indiana 46204 (317) 234-4423

Primary Radon Tester License

Certificate Number	Status	Expire Date
RTP00457	Active	12/31/2018

Kyle E. Hoylman

Jerome M. Adams, MD, MPH
State Health Commissioner
Indiana State Department of Health

STATE FORM 49122 (9-98)

REMOVE AT PERFORATION

INSTITUTE OF HAZARDOUS MATERIALS MANAGEMENT

THIS CERTIFIES THAT

CHRISTOPHER MICHAEL FERGUSON

HAS SUCCESSFULLY MET ALL THE REQUIREMENTS OF EDUCATION, EXPERIENCE AND EXAMINATION, AND IS HEREBY DESIGNATED A

CERTIFIED HAZARDOUS MATERIALS MANAGER
CHMM

October 11, 2011
DATE OF CERTIFICATION

15779
CREDENTIAL NUMBER

October 31, 2021
CERTIFICATION EXPIRES

M. Patricia Buley
ACTING EXECUTIVE DIRECTOR

VALID SO LONG AS THIS CREDENTIAL IS RENEWED ACCORDING TO SCHEDULE AND IS NOT OTHERWISE REVOKED.

ANSI Accredited Program PERSONNEL CERTIFICATION

Accredited by the American National Standards Institute and the Council of Engineering and Scientific Specialty Boards

Christopher Ferguson

Has satisfactorily fulfilled the requirements set forth by the
National Radon Proficiency Program and is therefore certified as a:

Residential Mitigation Provider

NRPP ID 109575 RMT
Expires 01/31/2020

Valid for specific activities or measurement devices, which can be verified with NRPP. State and local agencies may have additional requirements.

In witness Whereof,
I have subscribed my name as a
Representative of NRPP

Janna Sinclair

Janna Sinclair
NRPP Credentialing Coordinator

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

June 14, 2019

Mr. Greg Alfrey
Wilcox Environmental Engineering
1552 Main St
Suite 100
Indianapolis, IN 46224

RE: Project: O'Neals Depot
Pace Project No.: 50227291

Dear Mr. Alfrey:

Enclosed are the analytical results for sample(s) received by the laboratory on June 07, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mark E. Davis

Mark Davis
mark.davis@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Ms. Jessica Murphy, Wilcox Environmental Engineering
Data Services, Wilcox

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project:	O'Neals Depot
Pace Project No.:	50227291

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas/NELAP Certification #: E-10177
Kentucky UST Certification #: 80226
Kentucky WW Certification #: 98019
Michigan Department of Environmental Quality, Laboratory #9050
Ohio VAP Certification #: CL0065
Oklahoma Certification #: 2018-101
Texas Certification #: T104704355
West Virginia Certification #: 330
Wisconsin Certification #: 999788130
USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: O'Neals Depot
Pace Project No.: 50227291

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50227291001	**B-68_SO_4-5ft_190606**	Solid	06/06/19 09:45	06/07/19 08:55
50227291002	**B-69_SO_9-9.5ft_190606**	Solid	06/06/19 10:20	06/07/19 08:55
50227291003	**B-70_SO_9-9.5ft_190606**	Solid	06/06/19 10:50	06/07/19 08:55
50227291004	**B-71_SO_9-9.5ft_190606**	Solid	06/06/19 11:30	06/07/19 08:55
50227291005	**B-72_SO_9-9.5ft_190606**	Solid	06/06/19 13:05	06/07/19 08:55
50227291006	**B-73_SO_9-9.5ft_190606**	Solid	06/06/19 14:00	06/07/19 08:55
50227291007	**B-74_SO_9-9.5ft_190606**	Solid	06/06/19 15:00	06/07/19 08:55
50227291008	**B-75_SO_9-9.5ft_190606**	Solid	06/06/19 15:55	06/07/19 08:55
50227291009	**Dup-01_SO_190606**	Solid	06/06/19 23:59	06/07/19 08:55
50227291010	**B-68_WG_190606**	Water	06/06/19 09:55	06/07/19 08:55
50227291011	**B-69_WG_190606**	Water	06/06/19 10:35	06/07/19 08:55
50227291012	**B-70_WG_190606**	Water	06/06/19 11:04	06/07/19 08:55
50227291013	**B-71_WG_190606**	Water	06/06/19 11:42	06/07/19 08:55
50227291014	**B-72_WG_190606**	Water	06/06/19 13:19	06/07/19 08:55
50227291015	**B-73_WG_190606**	Water	06/06/19 14:30	06/07/19 08:55
50227291016	**B-74_WG_190606**	Water	06/06/19 15:20	06/07/19 08:55
50227291017	**B-75_WG_190606**	Water	06/06/19 16:15	06/07/19 08:55
50227291018	**Dup-01_WG_190606**	Water	06/06/19 23:59	06/07/19 08:55
50227291019	**TB-01_SO_190606**	Water	06/06/19 08:00	06/07/19 08:55

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SAMPLE ANALYTE COUNT

Project: O'Neals Depot
Pace Project No.: 50227291

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50227291001	**B-68_SO_4-5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291002	**B-69_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291003	**B-70_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291004	**B-71_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291005	**B-72_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291006	**B-73_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291007	**B-74_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291008	**B-75_SO_9-9.5ft_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291009	**Dup-01_SO_190606**	EPA 8260	ALA	75	PASI-I
		SM 2540G	RM1	1	PASI-I
50227291010	**B-68_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291011	**B-69_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291012	**B-70_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291013	**B-71_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291014	**B-72_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291015	**B-73_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291016	**B-74_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291017	**B-75_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291018	**Dup-01_WG_190606**	EPA 5030/8260	ALA	75	PASI-I
50227291019	**TB-01_SO_190606**	EPA 5030/8260	ALA	75	PASI-I

Pace Analytical www.pacelabs.com

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SUMMARY OF DETECTION

Project: O'Neals Depot
Pace Project No.: 50227291

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50227291001	**B-68_SO_4-5ft_190606**					
EPA 8260	Tetrachloroethene	36.6	ug/kg	4.7	06/13/19 03:04	
SM 2540G	Percent Moisture	16.9	%	0.10	06/11/19 14:31	
50227291002	**B-69_SO_9-9.5ft_190606**					
EPA 8260	Tetrachloroethene	13.0	ug/kg	4.8	06/13/19 03:42	
SM 2540G	Percent Moisture	14.4	%	0.10	06/11/19 14:31	
50227291003	**B-70_SO_9-9.5ft_190606**					
SM 2540G	Percent Moisture	17.7	%	0.10	06/11/19 15:08	
50227291004	**B-71_SO_9-9.5ft_190606**					
EPA 8260	Tetrachloroethene	44.0	ug/kg	5.1	06/13/19 04:58	
EPA 8260	Trichloroethene	7.7	ug/kg	5.1	06/13/19 04:58	
SM 2540G	Percent Moisture	15.5	%	0.10	06/11/19 15:08	
50227291005	**B-72_SO_9-9.5ft_190606**					
EPA 8260	Tetrachloroethene	53.1	ug/kg	5.2	06/13/19 05:36	
SM 2540G	Percent Moisture	12.9	%	0.10	06/11/19 15:09	
50227291006	**B-73_SO_9-9.5ft_190606**					
EPA 8260	Tetrachloroethene	86.3	ug/kg	4.9	06/13/19 06:14	
SM 2540G	Percent Moisture	12.4	%	0.10	06/11/19 15:09	
50227291007	**B-74_SO_9-9.5ft_190606**					
EPA 8260	Tetrachloroethene	156	ug/kg	4.9	06/13/19 06:52	
SM 2540G	Percent Moisture	11.8	%	0.10	06/11/19 15:09	
50227291008	**B-75_SO_9-9.5ft_190606**					
EPA 8260	Tetrachloroethene	70.4	ug/kg	4.7	06/13/19 07:30	
SM 2540G	Percent Moisture	10.3	%	0.10	06/11/19 15:09	
50227291009	**Dup-01_SO_190606**					
EPA 8260	Tetrachloroethene	9.4	ug/kg	5.5	06/13/19 08:08	
SM 2540G	Percent Moisture	14.2	%	0.10	06/11/19 15:10	
50227291010	**B-68_WG_190606**					
EPA 5030/8260	Tetrachloroethene	16.0	ug/L	5.0	06/13/19 13:57	
50227291011	**B-69_WG_190606**					
EPA 5030/8260	Tetrachloroethene	31.1	ug/L	5.0	06/13/19 14:36	
50227291013	**B-71_WG_190606**					
EPA 5030/8260	Tetrachloroethene	64.0	ug/L	5.0	06/13/19 15:52	
50227291014	**B-72_WG_190606**					
EPA 5030/8260	cis-1,2-Dichloroethene	6.8	ug/L	5.0	06/13/19 16:30	
EPA 5030/8260	Tetrachloroethene	104	ug/L	5.0	06/13/19 16:30	
50227291015	**B-73_WG_190606**					
EPA 5030/8260	cis-1,2-Dichloroethene	12.4	ug/L	5.0	06/13/19 17:08	
EPA 5030/8260	Tetrachloroethene	124	ug/L	5.0	06/13/19 17:08	

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SUMMARY OF DETECTION

Project: O'Neals Depot
Pace Project No.: 50227291

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50227291016	**B-74_WG_190606**					
EPA 5030/8260	Tetrachloroethene	186	ug/L	5.0	06/13/19 17:46	
50227291017	**B-75_WG_190606**					
EPA 5030/8260	Tetrachloroethene	52.5	ug/L	5.0	06/13/19 18:24	
50227291018	**Dup-01_WG_190606**					
EPA 5030/8260	Tetrachloroethene	68.1	ug/L	5.0	06/13/19 20:18	

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PROJECT NARRATIVE

Project: O'Neals Depot
Pace Project No.: 50227291

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: June 14, 2019

General Information:
10 samples were analyzed for EPA 5030/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 506310

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50227291017

R1: RPD value was outside control limits.

- MSD (Lab ID: 2336223)
  - 1,1-Dichloroethane
  - Vinyl acetate

Additional Comments:

Analyte Comments:

QC Batch: 506310

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- B-68_WG_190606 (Lab ID: 50227291010)
  - 1-Methylnaphthalene

PROJECT NARRATIVE

Project: O'Neals Depot
Pace Project No.: 50227291

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: June 14, 2019

Analyte Comments:

QC Batch: 506310

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- B-69_WG_190606 (Lab ID: 50227291011)
  - 1-Methylnaphthalene
- B-70_WG_190606 (Lab ID: 50227291012)
  - 1-Methylnaphthalene
- B-71_WG_190606 (Lab ID: 50227291013)
  - 1-Methylnaphthalene
- B-72_WG_190606 (Lab ID: 50227291014)
  - 1-Methylnaphthalene
- B-73_WG_190606 (Lab ID: 50227291015)
  - 1-Methylnaphthalene
- B-74_WG_190606 (Lab ID: 50227291016)
  - 1-Methylnaphthalene
- B-75_WG_190606 (Lab ID: 50227291017)
  - 1-Methylnaphthalene
- BLANK (Lab ID: 2336220)
  - 1-Methylnaphthalene
- Dup-01_WG_190606 (Lab ID: 50227291018)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2336221)
  - 1-Methylnaphthalene
- MS (Lab ID: 2336222)
  - 1-Methylnaphthalene
- MSD (Lab ID: 2336223)
  - 1-Methylnaphthalene
- TB-01_SO_190606 (Lab ID: 50227291019)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neals Depot
Pace Project No.: 50227291

Method: **EPA 8260**
Description: 8260 MSV 5035A VOA
Client: Wilcox Environmental Engineering, Inc.
Date: June 14, 2019

General Information:
9 samples were analyzed for EPA 8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 506062

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- B-68_SO_4-5ft_190606 (Lab ID: 50227291001)
  - 1-Methylnaphthalene
- B-69_SO_9-9.5ft_190606 (Lab ID: 50227291002)
  - 1-Methylnaphthalene
- B-70_SO_9-9.5ft_190606 (Lab ID: 50227291003)
  - 1-Methylnaphthalene
- B-71_SO_9-9.5ft_190606 (Lab ID: 50227291004)
  - 1-Methylnaphthalene
- B-72_SO_9-9.5ft_190606 (Lab ID: 50227291005)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neals Depot
Pace Project No.: 50227291

Method: **EPA 8260**
Description: 8260 MSV 5035A VOA
Client: Wilcox Environmental Engineering, Inc.
Date: June 14, 2019

Analyte Comments:

QC Batch: 506062

N2: The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

- B-73_SO_9-9.5ft_190606 (Lab ID: 50227291006)
  - 1-Methylnaphthalene
- B-74_SO_9-9.5ft_190606 (Lab ID: 50227291007)
  - 1-Methylnaphthalene
- B-75_SO_9-9.5ft_190606 (Lab ID: 50227291008)
  - 1-Methylnaphthalene
- BLANK (Lab ID: 2334968)
  - 1-Methylnaphthalene
- Dup-01_SO_190606 (Lab ID: 50227291009)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2334969)
  - 1-Methylnaphthalene

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-68_SO_4-5ft_190606 **Lab ID: 50227291001** Collected: 06/06/19 09:45 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	93.3	1		06/13/19 03:04	67-64-1	
Acrolein	ND	ug/kg	93.3	1		06/13/19 03:04	107-02-8	
Acrylonitrile	ND	ug/kg	93.3	1		06/13/19 03:04	107-13-1	
Benzene	ND	ug/kg	4.7	1		06/13/19 03:04	71-43-2	
Bromobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	108-86-1	
Bromochloromethane	ND	ug/kg	4.7	1		06/13/19 03:04	74-97-5	
Bromodichloromethane	ND	ug/kg	4.7	1		06/13/19 03:04	75-27-4	
Bromoform	ND	ug/kg	4.7	1		06/13/19 03:04	75-25-2	
Bromomethane	ND	ug/kg	4.7	1		06/13/19 03:04	74-83-9	
2-Butanone (MEK)	ND	ug/kg	23.3	1		06/13/19 03:04	78-93-3	
n-Butylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	104-51-8	
sec-Butylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	135-98-8	
tert-Butylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	98-06-6	
Carbon disulfide	ND	ug/kg	9.3	1		06/13/19 03:04	75-15-0	
Carbon tetrachloride	ND	ug/kg	4.7	1		06/13/19 03:04	56-23-5	
Chlorobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	108-90-7	
Chloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	75-00-3	
Chloroform	ND	ug/kg	4.7	1		06/13/19 03:04	67-66-3	
Chloromethane	ND	ug/kg	4.7	1		06/13/19 03:04	74-87-3	
2-Chlorotoluene	ND	ug/kg	4.7	1		06/13/19 03:04	95-49-8	
4-Chlorotoluene	ND	ug/kg	4.7	1		06/13/19 03:04	106-43-4	
Dibromochloromethane	ND	ug/kg	4.7	1		06/13/19 03:04	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.7	1		06/13/19 03:04	106-93-4	
Dibromomethane	ND	ug/kg	4.7	1		06/13/19 03:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	93.3	1		06/13/19 03:04	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	4.7	1		06/13/19 03:04	75-71-8	
1,1-Dichloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	75-34-3	
1,2-Dichloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	107-06-2	
1,1-Dichloroethene	ND	ug/kg	4.7	1		06/13/19 03:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	4.7	1		06/13/19 03:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	4.7	1		06/13/19 03:04	156-60-5	
1,2-Dichloropropane	ND	ug/kg	4.7	1		06/13/19 03:04	78-87-5	
1,3-Dichloropropane	ND	ug/kg	4.7	1		06/13/19 03:04	142-28-9	
2,2-Dichloropropane	ND	ug/kg	4.7	1		06/13/19 03:04	594-20-7	
1,1-Dichloropropene	ND	ug/kg	4.7	1		06/13/19 03:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	4.7	1		06/13/19 03:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	4.7	1		06/13/19 03:04	10061-02-6	
Ethylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	100-41-4	
Ethyl methacrylate	ND	ug/kg	93.3	1		06/13/19 03:04	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	4.7	1		06/13/19 03:04	87-68-3	
n-Hexane	ND	ug/kg	4.7	1		06/13/19 03:04	110-54-3	
2-Hexanone	ND	ug/kg	93.3	1		06/13/19 03:04	591-78-6	
Iodomethane	ND	ug/kg	93.3	1		06/13/19 03:04	74-88-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-68_SO_4-5ft_190606 **Lab ID: 50227291001** Collected: 06/06/19 09:45 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	4.7	1		06/13/19 03:04	98-82-8	
p-Isopropyltoluene	ND	ug/kg	4.7	1		06/13/19 03:04	99-87-6	
Methylene Chloride	ND	ug/kg	18.7	1		06/13/19 03:04	75-09-2	
1-Methylnaphthalene	ND	ug/kg	9.3	1		06/13/19 03:04	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	9.3	1		06/13/19 03:04	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	23.3	1		06/13/19 03:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	4.7	1		06/13/19 03:04	1634-04-4	
Naphthalene	ND	ug/kg	4.7	1		06/13/19 03:04	91-20-3	
n-Propylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	103-65-1	
Styrene	ND	ug/kg	4.7	1		06/13/19 03:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	79-34-5	
Tetrachloroethene	**36.6**	ug/kg	4.7	1		06/13/19 03:04	127-18-4	
Toluene	ND	ug/kg	4.7	1		06/13/19 03:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	4.7	1		06/13/19 03:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	4.7	1		06/13/19 03:04	79-00-5	
Trichloroethene	ND	ug/kg	4.7	1		06/13/19 03:04	79-01-6	
Trichlorofluoromethane	ND	ug/kg	4.7	1		06/13/19 03:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	4.7	1		06/13/19 03:04	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	4.7	1		06/13/19 03:04	108-67-8	
Vinyl acetate	ND	ug/kg	93.3	1		06/13/19 03:04	108-05-4	
Vinyl chloride	ND	ug/kg	4.7	1		06/13/19 03:04	75-01-4	
Xylene (Total)	ND	ug/kg	9.3	1		06/13/19 03:04	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	98	%.	77-131	1		06/13/19 03:04	1868-53-7	
Toluene-d8 (S)	99	%.	77-127	1		06/13/19 03:04	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	65-119	1		06/13/19 03:04	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**16.9**	%	0.10	1		06/11/19 14:31		

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-69_SO_9-9.5ft_190606 **Lab ID: 50227291002** Collected: 06/06/19 10:20 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	95.6	1		06/13/19 03:42	67-64-1	
Acrolein	ND	ug/kg	95.6	1		06/13/19 03:42	107-02-8	
Acrylonitrile	ND	ug/kg	95.6	1		06/13/19 03:42	107-13-1	
Benzene	ND	ug/kg	4.8	1		06/13/19 03:42	71-43-2	
Bromobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	108-86-1	
Bromochloromethane	ND	ug/kg	4.8	1		06/13/19 03:42	74-97-5	
Bromodichloromethane	ND	ug/kg	4.8	1		06/13/19 03:42	75-27-4	
Bromoform	ND	ug/kg	4.8	1		06/13/19 03:42	75-25-2	
Bromomethane	ND	ug/kg	4.8	1		06/13/19 03:42	74-83-9	
2-Butanone (MEK)	ND	ug/kg	23.9	1		06/13/19 03:42	78-93-3	
n-Butylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	104-51-8	
sec-Butylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	135-98-8	
tert-Butylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	98-06-6	
Carbon disulfide	ND	ug/kg	9.6	1		06/13/19 03:42	75-15-0	
Carbon tetrachloride	ND	ug/kg	4.8	1		06/13/19 03:42	56-23-5	
Chlorobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	108-90-7	
Chloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	75-00-3	
Chloroform	ND	ug/kg	4.8	1		06/13/19 03:42	67-66-3	
Chloromethane	ND	ug/kg	4.8	1		06/13/19 03:42	74-87-3	
2-Chlorotoluene	ND	ug/kg	4.8	1		06/13/19 03:42	95-49-8	
4-Chlorotoluene	ND	ug/kg	4.8	1		06/13/19 03:42	106-43-4	
Dibromochloromethane	ND	ug/kg	4.8	1		06/13/19 03:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.8	1		06/13/19 03:42	106-93-4	
Dibromomethane	ND	ug/kg	4.8	1		06/13/19 03:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	95.6	1		06/13/19 03:42	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	4.8	1		06/13/19 03:42	75-71-8	
1,1-Dichloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	75-34-3	
1,2-Dichloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	107-06-2	
1,1-Dichloroethene	ND	ug/kg	4.8	1		06/13/19 03:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	4.8	1		06/13/19 03:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	4.8	1		06/13/19 03:42	156-60-5	
1,2-Dichloropropane	ND	ug/kg	4.8	1		06/13/19 03:42	78-87-5	
1,3-Dichloropropane	ND	ug/kg	4.8	1		06/13/19 03:42	142-28-9	
2,2-Dichloropropane	ND	ug/kg	4.8	1		06/13/19 03:42	594-20-7	
1,1-Dichloropropene	ND	ug/kg	4.8	1		06/13/19 03:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	4.8	1		06/13/19 03:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	4.8	1		06/13/19 03:42	10061-02-6	
Ethylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	100-41-4	
Ethyl methacrylate	ND	ug/kg	95.6	1		06/13/19 03:42	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	4.8	1		06/13/19 03:42	87-68-3	
n-Hexane	ND	ug/kg	4.8	1		06/13/19 03:42	110-54-3	
2-Hexanone	ND	ug/kg	95.6	1		06/13/19 03:42	591-78-6	
Iodomethane	ND	ug/kg	95.6	1		06/13/19 03:42	74-88-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-69_SO_9-9.5ft_190606 **Lab ID: 50227291002** Collected: 06/06/19 10:20 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	4.8	1		06/13/19 03:42	98-82-8	
p-Isopropyltoluene	ND	ug/kg	4.8	1		06/13/19 03:42	99-87-6	
Methylene Chloride	ND	ug/kg	19.1	1		06/13/19 03:42	75-09-2	
1-Methylnaphthalene	ND	ug/kg	9.6	1		06/13/19 03:42	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	9.6	1		06/13/19 03:42	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	23.9	1		06/13/19 03:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	4.8	1		06/13/19 03:42	1634-04-4	
Naphthalene	ND	ug/kg	4.8	1		06/13/19 03:42	91-20-3	
n-Propylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	103-65-1	
Styrene	ND	ug/kg	4.8	1		06/13/19 03:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	79-34-5	
Tetrachloroethene	**13.0**	ug/kg	4.8	1		06/13/19 03:42	127-18-4	
Toluene	ND	ug/kg	4.8	1		06/13/19 03:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	4.8	1		06/13/19 03:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	4.8	1		06/13/19 03:42	79-00-5	
Trichloroethene	ND	ug/kg	4.8	1		06/13/19 03:42	79-01-6	
Trichlorofluoromethane	ND	ug/kg	4.8	1		06/13/19 03:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	4.8	1		06/13/19 03:42	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	4.8	1		06/13/19 03:42	108-67-8	
Vinyl acetate	ND	ug/kg	95.6	1		06/13/19 03:42	108-05-4	
Vinyl chloride	ND	ug/kg	4.8	1		06/13/19 03:42	75-01-4	
Xylene (Total)	ND	ug/kg	9.6	1		06/13/19 03:42	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	77-131	1		06/13/19 03:42	1868-53-7	
Toluene-d8 (S)	97	%.	77-127	1		06/13/19 03:42	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	65-119	1		06/13/19 03:42	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**14.4**	%	0.10	1		06/11/19 14:31		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-70_SO_9-9.5ft_190606 **Lab ID: 50227291003** Collected: 06/06/19 10:50 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	129	1		06/13/19 04:20	67-64-1	
Acrolein	ND	ug/kg	129	1		06/13/19 04:20	107-02-8	
Acrylonitrile	ND	ug/kg	129	1		06/13/19 04:20	107-13-1	
Benzene	ND	ug/kg	6.4	1		06/13/19 04:20	71-43-2	
Bromobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	108-86-1	
Bromochloromethane	ND	ug/kg	6.4	1		06/13/19 04:20	74-97-5	
Bromodichloromethane	ND	ug/kg	6.4	1		06/13/19 04:20	75-27-4	
Bromoform	ND	ug/kg	6.4	1		06/13/19 04:20	75-25-2	
Bromomethane	ND	ug/kg	6.4	1		06/13/19 04:20	74-83-9	
2-Butanone (MEK)	ND	ug/kg	32.1	1		06/13/19 04:20	78-93-3	
n-Butylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	104-51-8	
sec-Butylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	135-98-8	
tert-Butylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	98-06-6	
Carbon disulfide	ND	ug/kg	12.9	1		06/13/19 04:20	75-15-0	
Carbon tetrachloride	ND	ug/kg	6.4	1		06/13/19 04:20	56-23-5	
Chlorobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	108-90-7	
Chloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	75-00-3	
Chloroform	ND	ug/kg	6.4	1		06/13/19 04:20	67-66-3	
Chloromethane	ND	ug/kg	6.4	1		06/13/19 04:20	74-87-3	
2-Chlorotoluene	ND	ug/kg	6.4	1		06/13/19 04:20	95-49-8	
4-Chlorotoluene	ND	ug/kg	6.4	1		06/13/19 04:20	106-43-4	
Dibromochloromethane	ND	ug/kg	6.4	1		06/13/19 04:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	6.4	1		06/13/19 04:20	106-93-4	
Dibromomethane	ND	ug/kg	6.4	1		06/13/19 04:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	129	1		06/13/19 04:20	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	6.4	1		06/13/19 04:20	75-71-8	
1,1-Dichloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	75-34-3	
1,2-Dichloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	107-06-2	
1,1-Dichloroethene	ND	ug/kg	6.4	1		06/13/19 04:20	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	6.4	1		06/13/19 04:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	6.4	1		06/13/19 04:20	156-60-5	
1,2-Dichloropropane	ND	ug/kg	6.4	1		06/13/19 04:20	78-87-5	
1,3-Dichloropropane	ND	ug/kg	6.4	1		06/13/19 04:20	142-28-9	
2,2-Dichloropropane	ND	ug/kg	6.4	1		06/13/19 04:20	594-20-7	
1,1-Dichloropropene	ND	ug/kg	6.4	1		06/13/19 04:20	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	6.4	1		06/13/19 04:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	6.4	1		06/13/19 04:20	10061-02-6	
Ethylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	100-41-4	
Ethyl methacrylate	ND	ug/kg	129	1		06/13/19 04:20	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	6.4	1		06/13/19 04:20	87-68-3	
n-Hexane	ND	ug/kg	6.4	1		06/13/19 04:20	110-54-3	
2-Hexanone	ND	ug/kg	129	1		06/13/19 04:20	591-78-6	
Iodomethane	ND	ug/kg	129	1		06/13/19 04:20	74-88-4	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-70_SO_9-9.5ft_190606 **Lab ID: 50227291003** Collected: 06/06/19 10:50 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	6.4	1		06/13/19 04:20	98-82-8	
p-Isopropyltoluene	ND	ug/kg	6.4	1		06/13/19 04:20	99-87-6	
Methylene Chloride	ND	ug/kg	25.7	1		06/13/19 04:20	75-09-2	
1-Methylnaphthalene	ND	ug/kg	12.9	1		06/13/19 04:20	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	12.9	1		06/13/19 04:20	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	32.1	1		06/13/19 04:20	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	6.4	1		06/13/19 04:20	1634-04-4	
Naphthalene	ND	ug/kg	6.4	1		06/13/19 04:20	91-20-3	
n-Propylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	103-65-1	
Styrene	ND	ug/kg	6.4	1		06/13/19 04:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	79-34-5	
Tetrachloroethene	ND	ug/kg	6.4	1		06/13/19 04:20	127-18-4	
Toluene	ND	ug/kg	6.4	1		06/13/19 04:20	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	6.4	1		06/13/19 04:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	6.4	1		06/13/19 04:20	79-00-5	
Trichloroethene	ND	ug/kg	6.4	1		06/13/19 04:20	79-01-6	
Trichlorofluoromethane	ND	ug/kg	6.4	1		06/13/19 04:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	6.4	1		06/13/19 04:20	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	6.4	1		06/13/19 04:20	108-67-8	
Vinyl acetate	ND	ug/kg	129	1		06/13/19 04:20	108-05-4	
Vinyl chloride	ND	ug/kg	6.4	1		06/13/19 04:20	75-01-4	
Xylene (Total)	ND	ug/kg	12.9	1		06/13/19 04:20	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	100	%.	77-131	1		06/13/19 04:20	1868-53-7	
Toluene-d8 (S)	96	%.	77-127	1		06/13/19 04:20	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	65-119	1		06/13/19 04:20	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**17.7**	%	0.10	1		06/11/19 15:08		

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-71_SO_9-9.5ft_190606 **Lab ID: 50227291004** Collected: 06/06/19 11:30 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	103	1		06/13/19 04:58	67-64-1	
Acrolein	ND	ug/kg	103	1		06/13/19 04:58	107-02-8	
Acrylonitrile	ND	ug/kg	103	1		06/13/19 04:58	107-13-1	
Benzene	ND	ug/kg	5.1	1		06/13/19 04:58	71-43-2	
Bromobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	108-86-1	
Bromochloromethane	ND	ug/kg	5.1	1		06/13/19 04:58	74-97-5	
Bromodichloromethane	ND	ug/kg	5.1	1		06/13/19 04:58	75-27-4	
Bromoform	ND	ug/kg	5.1	1		06/13/19 04:58	75-25-2	
Bromomethane	ND	ug/kg	5.1	1		06/13/19 04:58	74-83-9	
2-Butanone (MEK)	ND	ug/kg	25.6	1		06/13/19 04:58	78-93-3	
n-Butylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	98-06-6	
Carbon disulfide	ND	ug/kg	10.3	1		06/13/19 04:58	75-15-0	
Carbon tetrachloride	ND	ug/kg	5.1	1		06/13/19 04:58	56-23-5	
Chlorobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	108-90-7	
Chloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	75-00-3	
Chloroform	ND	ug/kg	5.1	1		06/13/19 04:58	67-66-3	
Chloromethane	ND	ug/kg	5.1	1		06/13/19 04:58	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.1	1		06/13/19 04:58	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.1	1		06/13/19 04:58	106-43-4	
Dibromochloromethane	ND	ug/kg	5.1	1		06/13/19 04:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.1	1		06/13/19 04:58	106-93-4	
Dibromomethane	ND	ug/kg	5.1	1		06/13/19 04:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	103	1		06/13/19 04:58	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	5.1	1		06/13/19 04:58	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.1	1		06/13/19 04:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.1	1		06/13/19 04:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.1	1		06/13/19 04:58	156-60-5	
1,2-Dichloropropane	ND	ug/kg	5.1	1		06/13/19 04:58	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.1	1		06/13/19 04:58	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.1	1		06/13/19 04:58	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.1	1		06/13/19 04:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.1	1		06/13/19 04:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.1	1		06/13/19 04:58	10061-02-6	
Ethylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	100-41-4	
Ethyl methacrylate	ND	ug/kg	103	1		06/13/19 04:58	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	5.1	1		06/13/19 04:58	87-68-3	
n-Hexane	ND	ug/kg	5.1	1		06/13/19 04:58	110-54-3	
2-Hexanone	ND	ug/kg	103	1		06/13/19 04:58	591-78-6	
Iodomethane	ND	ug/kg	103	1		06/13/19 04:58	74-88-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-71_SO_9-9.5ft_190606 **Lab ID: 50227291004** Collected: 06/06/19 11:30 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	5.1	1		06/13/19 04:58	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.1	1		06/13/19 04:58	99-87-6	
Methylene Chloride	ND	ug/kg	20.5	1		06/13/19 04:58	75-09-2	
1-Methylnaphthalene	ND	ug/kg	10.3	1		06/13/19 04:58	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	10.3	1		06/13/19 04:58	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	25.6	1		06/13/19 04:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	5.1	1		06/13/19 04:58	1634-04-4	
Naphthalene	ND	ug/kg	5.1	1		06/13/19 04:58	91-20-3	
n-Propylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	103-65-1	
Styrene	ND	ug/kg	5.1	1		06/13/19 04:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	79-34-5	
Tetrachloroethene	**44.0**	ug/kg	5.1	1		06/13/19 04:58	127-18-4	
Toluene	ND	ug/kg	5.1	1		06/13/19 04:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.1	1		06/13/19 04:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.1	1		06/13/19 04:58	79-00-5	
Trichloroethene	**7.7**	ug/kg	5.1	1		06/13/19 04:58	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.1	1		06/13/19 04:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.1	1		06/13/19 04:58	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.1	1		06/13/19 04:58	108-67-8	
Vinyl acetate	ND	ug/kg	103	1		06/13/19 04:58	108-05-4	
Vinyl chloride	ND	ug/kg	5.1	1		06/13/19 04:58	75-01-4	
Xylene (Total)	ND	ug/kg	10.3	1		06/13/19 04:58	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	77-131	1		06/13/19 04:58	1868-53-7	
Toluene-d8 (S)	96	%.	77-127	1		06/13/19 04:58	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	65-119	1		06/13/19 04:58	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**15.5**	%	0.10	1		06/11/19 15:08		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-72_SO_9-9.5ft_190606 **Lab ID: 50227291005** Collected: 06/06/19 13:05 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	105	1		06/13/19 05:36	67-64-1	
Acrolein	ND	ug/kg	105	1		06/13/19 05:36	107-02-8	
Acrylonitrile	ND	ug/kg	105	1		06/13/19 05:36	107-13-1	
Benzene	ND	ug/kg	5.2	1		06/13/19 05:36	71-43-2	
Bromobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	108-86-1	
Bromochloromethane	ND	ug/kg	5.2	1		06/13/19 05:36	74-97-5	
Bromodichloromethane	ND	ug/kg	5.2	1		06/13/19 05:36	75-27-4	
Bromoform	ND	ug/kg	5.2	1		06/13/19 05:36	75-25-2	
Bromomethane	ND	ug/kg	5.2	1		06/13/19 05:36	74-83-9	
2-Butanone (MEK)	ND	ug/kg	26.2	1		06/13/19 05:36	78-93-3	
n-Butylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	98-06-6	
Carbon disulfide	ND	ug/kg	10.5	1		06/13/19 05:36	75-15-0	
Carbon tetrachloride	ND	ug/kg	5.2	1		06/13/19 05:36	56-23-5	
Chlorobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	108-90-7	
Chloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	75-00-3	
Chloroform	ND	ug/kg	5.2	1		06/13/19 05:36	67-66-3	
Chloromethane	ND	ug/kg	5.2	1		06/13/19 05:36	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.2	1		06/13/19 05:36	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.2	1		06/13/19 05:36	106-43-4	
Dibromochloromethane	ND	ug/kg	5.2	1		06/13/19 05:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.2	1		06/13/19 05:36	106-93-4	
Dibromomethane	ND	ug/kg	5.2	1		06/13/19 05:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	105	1		06/13/19 05:36	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	5.2	1		06/13/19 05:36	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.2	1		06/13/19 05:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.2	1		06/13/19 05:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.2	1		06/13/19 05:36	156-60-5	
1,2-Dichloropropane	ND	ug/kg	5.2	1		06/13/19 05:36	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.2	1		06/13/19 05:36	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.2	1		06/13/19 05:36	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.2	1		06/13/19 05:36	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.2	1		06/13/19 05:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.2	1		06/13/19 05:36	10061-02-6	
Ethylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	100-41-4	
Ethyl methacrylate	ND	ug/kg	105	1		06/13/19 05:36	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	5.2	1		06/13/19 05:36	87-68-3	
n-Hexane	ND	ug/kg	5.2	1		06/13/19 05:36	110-54-3	
2-Hexanone	ND	ug/kg	105	1		06/13/19 05:36	591-78-6	
Iodomethane	ND	ug/kg	105	1		06/13/19 05:36	74-88-4	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-72_SO_9-9.5ft_190606 **Lab ID: 50227291005** Collected: 06/06/19 13:05 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	5.2	1		06/13/19 05:36	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.2	1		06/13/19 05:36	99-87-6	
Methylene Chloride	ND	ug/kg	21.0	1		06/13/19 05:36	75-09-2	
1-Methylnaphthalene	ND	ug/kg	10.5	1		06/13/19 05:36	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	10.5	1		06/13/19 05:36	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	26.2	1		06/13/19 05:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	5.2	1		06/13/19 05:36	1634-04-4	
Naphthalene	ND	ug/kg	5.2	1		06/13/19 05:36	91-20-3	
n-Propylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	103-65-1	
Styrene	ND	ug/kg	5.2	1		06/13/19 05:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	79-34-5	
Tetrachloroethene	**53.1**	ug/kg	5.2	1		06/13/19 05:36	127-18-4	
Toluene	ND	ug/kg	5.2	1		06/13/19 05:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.2	1		06/13/19 05:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.2	1		06/13/19 05:36	79-00-5	
Trichloroethene	ND	ug/kg	5.2	1		06/13/19 05:36	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.2	1		06/13/19 05:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.2	1		06/13/19 05:36	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.2	1		06/13/19 05:36	108-67-8	
Vinyl acetate	ND	ug/kg	105	1		06/13/19 05:36	108-05-4	
Vinyl chloride	ND	ug/kg	5.2	1		06/13/19 05:36	75-01-4	
Xylene (Total)	ND	ug/kg	10.5	1		06/13/19 05:36	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	77-131	1		06/13/19 05:36	1868-53-7	
Toluene-d8 (S)	98	%.	77-127	1		06/13/19 05:36	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	65-119	1		06/13/19 05:36	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**12.9**	%	0.10	1		06/11/19 15:09		

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-73_SO_9-9.5ft_190606 **Lab ID: 50227291006** Collected: 06/06/19 14:00 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	97.6	1		06/13/19 06:14	67-64-1	
Acrolein	ND	ug/kg	97.6	1		06/13/19 06:14	107-02-8	
Acrylonitrile	ND	ug/kg	97.6	1		06/13/19 06:14	107-13-1	
Benzene	ND	ug/kg	4.9	1		06/13/19 06:14	71-43-2	
Bromobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	108-86-1	
Bromochloromethane	ND	ug/kg	4.9	1		06/13/19 06:14	74-97-5	
Bromodichloromethane	ND	ug/kg	4.9	1		06/13/19 06:14	75-27-4	
Bromoform	ND	ug/kg	4.9	1		06/13/19 06:14	75-25-2	
Bromomethane	ND	ug/kg	4.9	1		06/13/19 06:14	74-83-9	
2-Butanone (MEK)	ND	ug/kg	24.4	1		06/13/19 06:14	78-93-3	
n-Butylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	104-51-8	
sec-Butylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	135-98-8	
tert-Butylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	98-06-6	
Carbon disulfide	ND	ug/kg	9.8	1		06/13/19 06:14	75-15-0	
Carbon tetrachloride	ND	ug/kg	4.9	1		06/13/19 06:14	56-23-5	
Chlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	108-90-7	
Chloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	75-00-3	
Chloroform	ND	ug/kg	4.9	1		06/13/19 06:14	67-66-3	
Chloromethane	ND	ug/kg	4.9	1		06/13/19 06:14	74-87-3	
2-Chlorotoluene	ND	ug/kg	4.9	1		06/13/19 06:14	95-49-8	
4-Chlorotoluene	ND	ug/kg	4.9	1		06/13/19 06:14	106-43-4	
Dibromochloromethane	ND	ug/kg	4.9	1		06/13/19 06:14	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.9	1		06/13/19 06:14	106-93-4	
Dibromomethane	ND	ug/kg	4.9	1		06/13/19 06:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	97.6	1		06/13/19 06:14	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	4.9	1		06/13/19 06:14	75-71-8	
1,1-Dichloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	75-34-3	
1,2-Dichloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	107-06-2	
1,1-Dichloroethene	ND	ug/kg	4.9	1		06/13/19 06:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	4.9	1		06/13/19 06:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	4.9	1		06/13/19 06:14	156-60-5	
1,2-Dichloropropane	ND	ug/kg	4.9	1		06/13/19 06:14	78-87-5	
1,3-Dichloropropane	ND	ug/kg	4.9	1		06/13/19 06:14	142-28-9	
2,2-Dichloropropane	ND	ug/kg	4.9	1		06/13/19 06:14	594-20-7	
1,1-Dichloropropene	ND	ug/kg	4.9	1		06/13/19 06:14	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	4.9	1		06/13/19 06:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	4.9	1		06/13/19 06:14	10061-02-6	
Ethylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	100-41-4	
Ethyl methacrylate	ND	ug/kg	97.6	1		06/13/19 06:14	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	4.9	1		06/13/19 06:14	87-68-3	
n-Hexane	ND	ug/kg	4.9	1		06/13/19 06:14	110-54-3	
2-Hexanone	ND	ug/kg	97.6	1		06/13/19 06:14	591-78-6	
Iodomethane	ND	ug/kg	97.6	1		06/13/19 06:14	74-88-4	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-73_SO_9-9.5ft_190606 **Lab ID: 50227291006** Collected: 06/06/19 14:00 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	4.9	1		06/13/19 06:14	98-82-8	
p-Isopropyltoluene	ND	ug/kg	4.9	1		06/13/19 06:14	99-87-6	
Methylene Chloride	ND	ug/kg	19.5	1		06/13/19 06:14	75-09-2	
1-Methylnaphthalene	ND	ug/kg	9.8	1		06/13/19 06:14	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	9.8	1		06/13/19 06:14	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	24.4	1		06/13/19 06:14	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	4.9	1		06/13/19 06:14	1634-04-4	
Naphthalene	ND	ug/kg	4.9	1		06/13/19 06:14	91-20-3	
n-Propylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	103-65-1	
Styrene	ND	ug/kg	4.9	1		06/13/19 06:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	79-34-5	
Tetrachloroethene	**86.3**	ug/kg	4.9	1		06/13/19 06:14	127-18-4	
Toluene	ND	ug/kg	4.9	1		06/13/19 06:14	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:14	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	4.9	1		06/13/19 06:14	79-00-5	
Trichloroethene	ND	ug/kg	4.9	1		06/13/19 06:14	79-01-6	
Trichlorofluoromethane	ND	ug/kg	4.9	1		06/13/19 06:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	4.9	1		06/13/19 06:14	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	4.9	1		06/13/19 06:14	108-67-8	
Vinyl acetate	ND	ug/kg	97.6	1		06/13/19 06:14	108-05-4	
Vinyl chloride	ND	ug/kg	4.9	1		06/13/19 06:14	75-01-4	
Xylene (Total)	ND	ug/kg	9.8	1		06/13/19 06:14	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	98	%.	77-131	1		06/13/19 06:14	1868-53-7	
Toluene-d8 (S)	98	%.	77-127	1		06/13/19 06:14	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	65-119	1		06/13/19 06:14	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**12.4**	%	0.10	1		06/11/19 15:09		

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-74_SO_9-9.5ft_190606 **Lab ID: 50227291007** Collected: 06/06/19 15:00 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	97.1	1		06/13/19 06:52	67-64-1	
Acrolein	ND	ug/kg	97.1	1		06/13/19 06:52	107-02-8	
Acrylonitrile	ND	ug/kg	97.1	1		06/13/19 06:52	107-13-1	
Benzene	ND	ug/kg	4.9	1		06/13/19 06:52	71-43-2	
Bromobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	108-86-1	
Bromochloromethane	ND	ug/kg	4.9	1		06/13/19 06:52	74-97-5	
Bromodichloromethane	ND	ug/kg	4.9	1		06/13/19 06:52	75-27-4	
Bromoform	ND	ug/kg	4.9	1		06/13/19 06:52	75-25-2	
Bromomethane	ND	ug/kg	4.9	1		06/13/19 06:52	74-83-9	
2-Butanone (MEK)	ND	ug/kg	24.3	1		06/13/19 06:52	78-93-3	
n-Butylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	104-51-8	
sec-Butylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	135-98-8	
tert-Butylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	98-06-6	
Carbon disulfide	ND	ug/kg	9.7	1		06/13/19 06:52	75-15-0	
Carbon tetrachloride	ND	ug/kg	4.9	1		06/13/19 06:52	56-23-5	
Chlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	108-90-7	
Chloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	75-00-3	
Chloroform	ND	ug/kg	4.9	1		06/13/19 06:52	67-66-3	
Chloromethane	ND	ug/kg	4.9	1		06/13/19 06:52	74-87-3	
2-Chlorotoluene	ND	ug/kg	4.9	1		06/13/19 06:52	95-49-8	
4-Chlorotoluene	ND	ug/kg	4.9	1		06/13/19 06:52	106-43-4	
Dibromochloromethane	ND	ug/kg	4.9	1		06/13/19 06:52	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.9	1		06/13/19 06:52	106-93-4	
Dibromomethane	ND	ug/kg	4.9	1		06/13/19 06:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	97.1	1		06/13/19 06:52	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	4.9	1		06/13/19 06:52	75-71-8	
1,1-Dichloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	75-34-3	
1,2-Dichloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	107-06-2	
1,1-Dichloroethene	ND	ug/kg	4.9	1		06/13/19 06:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	4.9	1		06/13/19 06:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	4.9	1		06/13/19 06:52	156-60-5	
1,2-Dichloropropane	ND	ug/kg	4.9	1		06/13/19 06:52	78-87-5	
1,3-Dichloropropane	ND	ug/kg	4.9	1		06/13/19 06:52	142-28-9	
2,2-Dichloropropane	ND	ug/kg	4.9	1		06/13/19 06:52	594-20-7	
1,1-Dichloropropene	ND	ug/kg	4.9	1		06/13/19 06:52	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	4.9	1		06/13/19 06:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	4.9	1		06/13/19 06:52	10061-02-6	
Ethylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	100-41-4	
Ethyl methacrylate	ND	ug/kg	97.1	1		06/13/19 06:52	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	4.9	1		06/13/19 06:52	87-68-3	
n-Hexane	ND	ug/kg	4.9	1		06/13/19 06:52	110-54-3	
2-Hexanone	ND	ug/kg	97.1	1		06/13/19 06:52	591-78-6	
Iodomethane	ND	ug/kg	97.1	1		06/13/19 06:52	74-88-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-74_SO_9-9.5ft_190606 **Lab ID: 50227291007** Collected: 06/06/19 15:00 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	4.9	1		06/13/19 06:52	98-82-8	
p-Isopropyltoluene	ND	ug/kg	4.9	1		06/13/19 06:52	99-87-6	
Methylene Chloride	ND	ug/kg	19.4	1		06/13/19 06:52	75-09-2	
1-Methylnaphthalene	ND	ug/kg	9.7	1		06/13/19 06:52	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	9.7	1		06/13/19 06:52	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	24.3	1		06/13/19 06:52	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	4.9	1		06/13/19 06:52	1634-04-4	
Naphthalene	ND	ug/kg	4.9	1		06/13/19 06:52	91-20-3	
n-Propylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	103-65-1	
Styrene	ND	ug/kg	4.9	1		06/13/19 06:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	79-34-5	
Tetrachloroethene	**156**	ug/kg	4.9	1		06/13/19 06:52	127-18-4	
Toluene	ND	ug/kg	4.9	1		06/13/19 06:52	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	4.9	1		06/13/19 06:52	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	4.9	1		06/13/19 06:52	79-00-5	
Trichloroethene	ND	ug/kg	4.9	1		06/13/19 06:52	79-01-6	
Trichlorofluoromethane	ND	ug/kg	4.9	1		06/13/19 06:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	4.9	1		06/13/19 06:52	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	4.9	1		06/13/19 06:52	108-67-8	
Vinyl acetate	ND	ug/kg	97.1	1		06/13/19 06:52	108-05-4	
Vinyl chloride	ND	ug/kg	4.9	1		06/13/19 06:52	75-01-4	
Xylene (Total)	ND	ug/kg	9.7	1		06/13/19 06:52	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	77-131	1		06/13/19 06:52	1868-53-7	
Toluene-d8 (S)	100	%.	77-127	1		06/13/19 06:52	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	65-119	1		06/13/19 06:52	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**11.8**	%	0.10	1		06/11/19 15:09		

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-75_SO_9-9.5ft_190606 **Lab ID: 50227291008** Collected: 06/06/19 15:55 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	94.8	1		06/13/19 07:30	67-64-1	
Acrolein	ND	ug/kg	94.8	1		06/13/19 07:30	107-02-8	
Acrylonitrile	ND	ug/kg	94.8	1		06/13/19 07:30	107-13-1	
Benzene	ND	ug/kg	4.7	1		06/13/19 07:30	71-43-2	
Bromobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	108-86-1	
Bromochloromethane	ND	ug/kg	4.7	1		06/13/19 07:30	74-97-5	
Bromodichloromethane	ND	ug/kg	4.7	1		06/13/19 07:30	75-27-4	
Bromoform	ND	ug/kg	4.7	1		06/13/19 07:30	75-25-2	
Bromomethane	ND	ug/kg	4.7	1		06/13/19 07:30	74-83-9	
2-Butanone (MEK)	ND	ug/kg	23.7	1		06/13/19 07:30	78-93-3	
n-Butylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	104-51-8	
sec-Butylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	135-98-8	
tert-Butylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	98-06-6	
Carbon disulfide	ND	ug/kg	9.5	1		06/13/19 07:30	75-15-0	
Carbon tetrachloride	ND	ug/kg	4.7	1		06/13/19 07:30	56-23-5	
Chlorobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	108-90-7	
Chloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	75-00-3	
Chloroform	ND	ug/kg	4.7	1		06/13/19 07:30	67-66-3	
Chloromethane	ND	ug/kg	4.7	1		06/13/19 07:30	74-87-3	
2-Chlorotoluene	ND	ug/kg	4.7	1		06/13/19 07:30	95-49-8	
4-Chlorotoluene	ND	ug/kg	4.7	1		06/13/19 07:30	106-43-4	
Dibromochloromethane	ND	ug/kg	4.7	1		06/13/19 07:30	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.7	1		06/13/19 07:30	106-93-4	
Dibromomethane	ND	ug/kg	4.7	1		06/13/19 07:30	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	94.8	1		06/13/19 07:30	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	4.7	1		06/13/19 07:30	75-71-8	
1,1-Dichloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	75-34-3	
1,2-Dichloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	107-06-2	
1,1-Dichloroethene	ND	ug/kg	4.7	1		06/13/19 07:30	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	4.7	1		06/13/19 07:30	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	4.7	1		06/13/19 07:30	156-60-5	
1,2-Dichloropropane	ND	ug/kg	4.7	1		06/13/19 07:30	78-87-5	
1,3-Dichloropropane	ND	ug/kg	4.7	1		06/13/19 07:30	142-28-9	
2,2-Dichloropropane	ND	ug/kg	4.7	1		06/13/19 07:30	594-20-7	
1,1-Dichloropropene	ND	ug/kg	4.7	1		06/13/19 07:30	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	4.7	1		06/13/19 07:30	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	4.7	1		06/13/19 07:30	10061-02-6	
Ethylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	100-41-4	
Ethyl methacrylate	ND	ug/kg	94.8	1		06/13/19 07:30	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	4.7	1		06/13/19 07:30	87-68-3	
n-Hexane	ND	ug/kg	4.7	1		06/13/19 07:30	110-54-3	
2-Hexanone	ND	ug/kg	94.8	1		06/13/19 07:30	591-78-6	
Iodomethane	ND	ug/kg	94.8	1		06/13/19 07:30	74-88-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-75_SO_9-9.5ft_190606 **Lab ID: 50227291008** Collected: 06/06/19 15:55 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	4.7	1		06/13/19 07:30	98-82-8	
p-Isopropyltoluene	ND	ug/kg	4.7	1		06/13/19 07:30	99-87-6	
Methylene Chloride	ND	ug/kg	19.0	1		06/13/19 07:30	75-09-2	
1-Methylnaphthalene	ND	ug/kg	9.5	1		06/13/19 07:30	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	9.5	1		06/13/19 07:30	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	23.7	1		06/13/19 07:30	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	4.7	1		06/13/19 07:30	1634-04-4	
Naphthalene	ND	ug/kg	4.7	1		06/13/19 07:30	91-20-3	
n-Propylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	103-65-1	
Styrene	ND	ug/kg	4.7	1		06/13/19 07:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	79-34-5	
Tetrachloroethene	**70.4**	ug/kg	4.7	1		06/13/19 07:30	127-18-4	
Toluene	ND	ug/kg	4.7	1		06/13/19 07:30	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	4.7	1		06/13/19 07:30	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	4.7	1		06/13/19 07:30	79-00-5	
Trichloroethene	ND	ug/kg	4.7	1		06/13/19 07:30	79-01-6	
Trichlorofluoromethane	ND	ug/kg	4.7	1		06/13/19 07:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	4.7	1		06/13/19 07:30	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	4.7	1		06/13/19 07:30	108-67-8	
Vinyl acetate	ND	ug/kg	94.8	1		06/13/19 07:30	108-05-4	
Vinyl chloride	ND	ug/kg	4.7	1		06/13/19 07:30	75-01-4	
Xylene (Total)	ND	ug/kg	9.5	1		06/13/19 07:30	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	77-131	1		06/13/19 07:30	1868-53-7	
Toluene-d8 (S)	98	%.	77-127	1		06/13/19 07:30	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	65-119	1		06/13/19 07:30	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**10.3**	%	0.10	1		06/11/19 15:09		

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: Dup-01_SO_190606 **Lab ID: 50227291009** Collected: 06/06/19 23:59 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	111	1		06/13/19 08:08	67-64-1	
Acrolein	ND	ug/kg	111	1		06/13/19 08:08	107-02-8	
Acrylonitrile	ND	ug/kg	111	1		06/13/19 08:08	107-13-1	
Benzene	ND	ug/kg	5.5	1		06/13/19 08:08	71-43-2	
Bromobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	108-86-1	
Bromochloromethane	ND	ug/kg	5.5	1		06/13/19 08:08	74-97-5	
Bromodichloromethane	ND	ug/kg	5.5	1		06/13/19 08:08	75-27-4	
Bromoform	ND	ug/kg	5.5	1		06/13/19 08:08	75-25-2	
Bromomethane	ND	ug/kg	5.5	1		06/13/19 08:08	74-83-9	
2-Butanone (MEK)	ND	ug/kg	27.7	1		06/13/19 08:08	78-93-3	
n-Butylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	98-06-6	
Carbon disulfide	ND	ug/kg	11.1	1		06/13/19 08:08	75-15-0	
Carbon tetrachloride	ND	ug/kg	5.5	1		06/13/19 08:08	56-23-5	
Chlorobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	108-90-7	
Chloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	75-00-3	
Chloroform	ND	ug/kg	5.5	1		06/13/19 08:08	67-66-3	
Chloromethane	ND	ug/kg	5.5	1		06/13/19 08:08	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.5	1		06/13/19 08:08	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.5	1		06/13/19 08:08	106-43-4	
Dibromochloromethane	ND	ug/kg	5.5	1		06/13/19 08:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.5	1		06/13/19 08:08	106-93-4	
Dibromomethane	ND	ug/kg	5.5	1		06/13/19 08:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/kg	111	1		06/13/19 08:08	110-57-6	
Dichlorodifluoromethane	ND	ug/kg	5.5	1		06/13/19 08:08	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.5	1		06/13/19 08:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.5	1		06/13/19 08:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.5	1		06/13/19 08:08	156-60-5	
1,2-Dichloropropane	ND	ug/kg	5.5	1		06/13/19 08:08	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.5	1		06/13/19 08:08	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.5	1		06/13/19 08:08	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.5	1		06/13/19 08:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.5	1		06/13/19 08:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.5	1		06/13/19 08:08	10061-02-6	
Ethylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	100-41-4	
Ethyl methacrylate	ND	ug/kg	111	1		06/13/19 08:08	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/kg	5.5	1		06/13/19 08:08	87-68-3	
n-Hexane	ND	ug/kg	5.5	1		06/13/19 08:08	110-54-3	
2-Hexanone	ND	ug/kg	111	1		06/13/19 08:08	591-78-6	
Iodomethane	ND	ug/kg	111	1		06/13/19 08:08	74-88-4	

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: Dup-01_SO_190606 **Lab ID: 50227291009** Collected: 06/06/19 23:59 Received: 06/07/19 08:55 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035A VOA	Analytical Method: EPA 8260							
Isopropylbenzene (Cumene)	ND	ug/kg	5.5	1		06/13/19 08:08	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.5	1		06/13/19 08:08	99-87-6	
Methylene Chloride	ND	ug/kg	22.1	1		06/13/19 08:08	75-09-2	
1-Methylnaphthalene	ND	ug/kg	11.1	1		06/13/19 08:08	90-12-0	N2
2-Methylnaphthalene	ND	ug/kg	11.1	1		06/13/19 08:08	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	27.7	1		06/13/19 08:08	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	5.5	1		06/13/19 08:08	1634-04-4	
Naphthalene	ND	ug/kg	5.5	1		06/13/19 08:08	91-20-3	
n-Propylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	103-65-1	
Styrene	ND	ug/kg	5.5	1		06/13/19 08:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	79-34-5	
Tetrachloroethene	**9.4**	ug/kg	5.5	1		06/13/19 08:08	127-18-4	
Toluene	ND	ug/kg	5.5	1		06/13/19 08:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.5	1		06/13/19 08:08	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.5	1		06/13/19 08:08	79-00-5	
Trichloroethene	ND	ug/kg	5.5	1		06/13/19 08:08	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.5	1		06/13/19 08:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.5	1		06/13/19 08:08	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.5	1		06/13/19 08:08	108-67-8	
Vinyl acetate	ND	ug/kg	111	1		06/13/19 08:08	108-05-4	
Vinyl chloride	ND	ug/kg	5.5	1		06/13/19 08:08	75-01-4	
Xylene (Total)	ND	ug/kg	11.1	1		06/13/19 08:08	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	102	%.	77-131	1		06/13/19 08:08	1868-53-7	
Toluene-d8 (S)	98	%.	77-127	1		06/13/19 08:08	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	65-119	1		06/13/19 08:08	460-00-4	
Percent Moisture	Analytical Method: SM 2540G							
Percent Moisture	**14.2**	%	0.10	1		06/11/19 15:10		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-68_WG_190606 **Lab ID: 50227291010** Collected: 06/06/19 09:55 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 13:57	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 13:57	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 13:57	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 13:57	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 13:57	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 13:57	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 13:57	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 13:57	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 13:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 13:57	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 13:57	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 13:57	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 13:57	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 13:57	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 13:57	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 13:57	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 13:57	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 13:57	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 13:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 13:57	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 13:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 13:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 13:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 13:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 13:57	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 13:57	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 13:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 13:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 13:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 13:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 13:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 13:57	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 13:57	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 13:57	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 13:57	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 13:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 13:57	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 13:57	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 13:57	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 13:57	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 13:57	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 13:57	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 13:57	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-68_WG_190606 **Lab ID: 50227291010** Collected: 06/06/19 09:55 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 13:57	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 13:57	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 13:57	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 13:57	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 13:57	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 13:57	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 13:57	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 13:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 13:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 13:57	79-34-5	
Tetrachloroethene	**16.0**	ug/L	5.0	1		06/13/19 13:57	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 13:57	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 13:57	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 13:57	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 13:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 13:57	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 13:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 13:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 13:57	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 13:57	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 13:57	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 13:57	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 13:57	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	105	%.	80-122	1		06/13/19 13:57	1868-53-7	
4-Bromofluorobenzene (S)	102	%.	85-114	1		06/13/19 13:57	460-00-4	
Toluene-d8 (S)	93	%.	85-114	1		06/13/19 13:57	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-69_WG_190606 **Lab ID: 50227291011** Collected: 06/06/19 10:35 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 14:36	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 14:36	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 14:36	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 14:36	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 14:36	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 14:36	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 14:36	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 14:36	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 14:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 14:36	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 14:36	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 14:36	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 14:36	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 14:36	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 14:36	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 14:36	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 14:36	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 14:36	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 14:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 14:36	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 14:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 14:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 14:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 14:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 14:36	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 14:36	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 14:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 14:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 14:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 14:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 14:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 14:36	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 14:36	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 14:36	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 14:36	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 14:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 14:36	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 14:36	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 14:36	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 14:36	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 14:36	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 14:36	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 14:36	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-69_WG_190606 **Lab ID: 50227291011** Collected: 06/06/19 10:35 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 14:36	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 14:36	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 14:36	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 14:36	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 14:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 14:36	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 14:36	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 14:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 14:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 14:36	79-34-5	
Tetrachloroethene	**31.1**	ug/L	5.0	1		06/13/19 14:36	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 14:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 14:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 14:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 14:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 14:36	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 14:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 14:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 14:36	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 14:36	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 14:36	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 14:36	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 14:36	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	105	%.	80-122	1		06/13/19 14:36	1868-53-7	
4-Bromofluorobenzene (S)	105	%.	85-114	1		06/13/19 14:36	460-00-4	
Toluene-d8 (S)	94	%.	85-114	1		06/13/19 14:36	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-70_WG_190606 **Lab ID: 50227291012** Collected: 06/06/19 11:04 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 15:13	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 15:13	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 15:13	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 15:13	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 15:13	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 15:13	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 15:13	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 15:13	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 15:13	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 15:13	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 15:13	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 15:13	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 15:13	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 15:13	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 15:13	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 15:13	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 15:13	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 15:13	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 15:13	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 15:13	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 15:13	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:13	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:13	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:13	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 15:13	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 15:13	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 15:13	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 15:13	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 15:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 15:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 15:13	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 15:13	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 15:13	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 15:13	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 15:13	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 15:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 15:13	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 15:13	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 15:13	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 15:13	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 15:13	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 15:13	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 15:13	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-70_WG_190606 **Lab ID: 50227291012** Collected: 06/06/19 11:04 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 15:13	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 15:13	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 15:13	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 15:13	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 15:13	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 15:13	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 15:13	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 15:13	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 15:13	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 15:13	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		06/13/19 15:13	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 15:13	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:13	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:13	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 15:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 15:13	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 15:13	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 15:13	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 15:13	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 15:13	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 15:13	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 15:13	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 15:13	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	106	%.	80-122	1		06/13/19 15:13	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	85-114	1		06/13/19 15:13	460-00-4	
Toluene-d8 (S)	93	%.	85-114	1		06/13/19 15:13	2037-26-5	

Pace Analytical Services, LLC
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-71_WG_190606 **Lab ID: 50227291013** Collected: 06/06/19 11:42 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 15:52	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 15:52	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 15:52	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 15:52	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 15:52	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 15:52	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 15:52	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 15:52	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 15:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 15:52	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 15:52	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 15:52	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 15:52	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 15:52	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 15:52	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 15:52	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 15:52	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 15:52	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 15:52	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 15:52	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 15:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:52	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:52	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 15:52	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 15:52	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 15:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 15:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 15:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 15:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 15:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 15:52	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 15:52	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 15:52	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 15:52	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 15:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 15:52	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 15:52	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 15:52	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 15:52	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 15:52	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 15:52	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 15:52	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-71_WG_190606 **Lab ID: 50227291013** Collected: 06/06/19 11:42 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 15:52	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 15:52	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 15:52	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 15:52	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 15:52	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 15:52	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 15:52	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 15:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 15:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 15:52	79-34-5	
Tetrachloroethene	**64.0**	ug/L	5.0	1		06/13/19 15:52	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 15:52	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:52	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 15:52	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 15:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 15:52	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 15:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 15:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 15:52	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 15:52	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 15:52	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 15:52	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 15:52	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	105	%.	80-122	1		06/13/19 15:52	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	85-114	1		06/13/19 15:52	460-00-4	
Toluene-d8 (S)	92	%.	85-114	1		06/13/19 15:52	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-72_WG_190606 **Lab ID: 50227291014** Collected: 06/06/19 13:19 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 16:30	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 16:30	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 16:30	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 16:30	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 16:30	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 16:30	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 16:30	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 16:30	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 16:30	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 16:30	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 16:30	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 16:30	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 16:30	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 16:30	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 16:30	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 16:30	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 16:30	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 16:30	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 16:30	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 16:30	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 16:30	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 16:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 16:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 16:30	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 16:30	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 16:30	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 16:30	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 16:30	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 16:30	75-35-4	
cis-1,2-Dichloroethene	**6.8**	ug/L	5.0	1		06/13/19 16:30	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 16:30	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 16:30	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 16:30	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 16:30	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 16:30	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 16:30	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 16:30	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 16:30	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 16:30	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 16:30	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 16:30	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 16:30	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 16:30	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-72_WG_190606 **Lab ID: 50227291014** Collected: 06/06/19 13:19 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 16:30	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 16:30	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 16:30	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 16:30	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 16:30	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 16:30	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 16:30	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 16:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 16:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 16:30	79-34-5	
Tetrachloroethene	**104**	ug/L	5.0	1		06/13/19 16:30	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 16:30	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 16:30	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 16:30	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 16:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 16:30	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 16:30	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 16:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 16:30	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 16:30	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 16:30	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 16:30	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 16:30	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	102	%.	80-122	1		06/13/19 16:30	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	85-114	1		06/13/19 16:30	460-00-4	
Toluene-d8 (S)	94	%.	85-114	1		06/13/19 16:30	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-73_WG_190606 **Lab ID: 50227291015** Collected: 06/06/19 14:30 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 17:08	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 17:08	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 17:08	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 17:08	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 17:08	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 17:08	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 17:08	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 17:08	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 17:08	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 17:08	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 17:08	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 17:08	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 17:08	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 17:08	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 17:08	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 17:08	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 17:08	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 17:08	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 17:08	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 17:08	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 17:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:08	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:08	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:08	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 17:08	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 17:08	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 17:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 17:08	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 17:08	75-35-4	
cis-1,2-Dichloroethene	**12.4**	ug/L	5.0	1		06/13/19 17:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 17:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 17:08	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 17:08	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 17:08	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 17:08	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 17:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 17:08	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 17:08	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 17:08	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 17:08	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 17:08	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 17:08	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 17:08	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-73_WG_190606 **Lab ID: 50227291015** Collected: 06/06/19 14:30 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 17:08	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 17:08	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 17:08	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 17:08	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 17:08	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 17:08	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 17:08	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 17:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 17:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 17:08	79-34-5	
Tetrachloroethene	**124**	ug/L	5.0	1		06/13/19 17:08	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 17:08	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:08	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:08	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 17:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 17:08	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 17:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 17:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 17:08	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 17:08	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 17:08	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 17:08	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 17:08	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	102	%.	80-122	1		06/13/19 17:08	1868-53-7	
4-Bromofluorobenzene (S)	105	%.	85-114	1		06/13/19 17:08	460-00-4	
Toluene-d8 (S)	94	%.	85-114	1		06/13/19 17:08	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-74_WG_190606 **Lab ID: 50227291016** Collected: 06/06/19 15:20 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 17:46	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 17:46	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 17:46	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 17:46	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 17:46	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 17:46	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 17:46	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 17:46	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 17:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 17:46	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 17:46	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 17:46	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 17:46	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 17:46	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 17:46	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 17:46	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 17:46	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 17:46	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 17:46	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 17:46	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 17:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:46	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 17:46	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 17:46	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 17:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 17:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 17:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 17:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 17:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 17:46	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 17:46	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 17:46	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 17:46	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 17:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 17:46	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 17:46	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 17:46	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 17:46	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 17:46	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 17:46	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 17:46	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-74_WG_190606 **Lab ID: 50227291016** Collected: 06/06/19 15:20 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 17:46	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 17:46	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 17:46	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 17:46	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 17:46	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 17:46	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 17:46	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 17:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 17:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 17:46	79-34-5	
Tetrachloroethene	**186**	ug/L	5.0	1		06/13/19 17:46	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 17:46	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:46	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 17:46	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 17:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 17:46	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 17:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 17:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 17:46	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 17:46	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 17:46	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 17:46	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 17:46	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	101	%.	80-122	1		06/13/19 17:46	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	85-114	1		06/13/19 17:46	460-00-4	
Toluene-d8 (S)	95	%.	85-114	1		06/13/19 17:46	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-75_WG_190606 **Lab ID: 50227291017** Collected: 06/06/19 16:15 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 18:24	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 18:24	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 18:24	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 18:24	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 18:24	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 18:24	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 18:24	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 18:24	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 18:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 18:24	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 18:24	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 18:24	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 18:24	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 18:24	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 18:24	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 18:24	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 18:24	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 18:24	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 18:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 18:24	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 18:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 18:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 18:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 18:24	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 18:24	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 18:24	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 18:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 18:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 18:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 18:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 18:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 18:24	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 18:24	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 18:24	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 18:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 18:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 18:24	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 18:24	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 18:24	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 18:24	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 18:24	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 18:24	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 18:24	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: B-75_WG_190606 **Lab ID: 50227291017** Collected: 06/06/19 16:15 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 18:24	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 18:24	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 18:24	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 18:24	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 18:24	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 18:24	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 18:24	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 18:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 18:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 18:24	79-34-5	
Tetrachloroethene	**52.5**	ug/L	5.0	1		06/13/19 18:24	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 18:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 18:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 18:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 18:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 18:24	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 18:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 18:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 18:24	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 18:24	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 18:24	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 18:24	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 18:24	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	103	%.	80-122	1		06/13/19 18:24	1868-53-7	
4-Bromofluorobenzene (S)	102	%.	85-114	1		06/13/19 18:24	460-00-4	
Toluene-d8 (S)	95	%.	85-114	1		06/13/19 18:24	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: Dup-01_WG_190606 **Lab ID: 50227291018** Collected: 06/06/19 23:59 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 20:18	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 20:18	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 20:18	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 20:18	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 20:18	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 20:18	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 20:18	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 20:18	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 20:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 20:18	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 20:18	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 20:18	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 20:18	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 20:18	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 20:18	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 20:18	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 20:18	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 20:18	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 20:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 20:18	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 20:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 20:18	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 20:18	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 20:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 20:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 20:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 20:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 20:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 20:18	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 20:18	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 20:18	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 20:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 20:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 20:18	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 20:18	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 20:18	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 20:18	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 20:18	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 20:18	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 20:18	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: Dup-01_WG_190606 **Lab ID: 50227291018** Collected: 06/06/19 23:59 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 20:18	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 20:18	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 20:18	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 20:18	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 20:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 20:18	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 20:18	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 20:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 20:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 20:18	79-34-5	
Tetrachloroethene	**68.1**	ug/L	5.0	1		06/13/19 20:18	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 20:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 20:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 20:18	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 20:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 20:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 20:18	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 20:18	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 20:18	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 20:18	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 20:18	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	104	%.	80-122	1		06/13/19 20:18	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	85-114	1		06/13/19 20:18	460-00-4	
Toluene-d8 (S)	95	%.	85-114	1		06/13/19 20:18	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: TB-01_SO_190606 **Lab ID: 50227291019** Collected: 06/06/19 08:00 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		06/13/19 20:56	67-64-1	
Acrolein	ND	ug/L	50.0	1		06/13/19 20:56	107-02-8	
Acrylonitrile	ND	ug/L	100	1		06/13/19 20:56	107-13-1	
Benzene	ND	ug/L	5.0	1		06/13/19 20:56	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		06/13/19 20:56	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		06/13/19 20:56	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		06/13/19 20:56	75-27-4	
Bromoform	ND	ug/L	5.0	1		06/13/19 20:56	75-25-2	
Bromomethane	ND	ug/L	5.0	1		06/13/19 20:56	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		06/13/19 20:56	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		06/13/19 20:56	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		06/13/19 20:56	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		06/13/19 20:56	108-90-7	
Chloroethane	ND	ug/L	5.0	1		06/13/19 20:56	75-00-3	
Chloroform	ND	ug/L	5.0	1		06/13/19 20:56	67-66-3	
Chloromethane	ND	ug/L	5.0	1		06/13/19 20:56	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 20:56	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		06/13/19 20:56	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		06/13/19 20:56	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		06/13/19 20:56	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		06/13/19 20:56	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:56	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:56	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:56	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		06/13/19 20:56	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		06/13/19 20:56	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		06/13/19 20:56	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		06/13/19 20:56	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		06/13/19 20:56	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 20:56	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		06/13/19 20:56	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 20:56	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		06/13/19 20:56	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		06/13/19 20:56	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		06/13/19 20:56	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 20:56	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		06/13/19 20:56	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		06/13/19 20:56	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		06/13/19 20:56	87-68-3	
n-Hexane	ND	ug/L	5.0	1		06/13/19 20:56	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		06/13/19 20:56	591-78-6	
Iodomethane	ND	ug/L	10.0	1		06/13/19 20:56	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		06/13/19 20:56	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Depot
Pace Project No.: 50227291

Sample: TB-01_SO_190606 **Lab ID: 50227291019** Collected: 06/06/19 08:00 Received: 06/07/19 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		06/13/19 20:56	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		06/13/19 20:56	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 20:56	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		06/13/19 20:56	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		06/13/19 20:56	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		06/13/19 20:56	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		06/13/19 20:56	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	103-65-1	
Styrene	ND	ug/L	5.0	1		06/13/19 20:56	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 20:56	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		06/13/19 20:56	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		06/13/19 20:56	127-18-4	
Toluene	ND	ug/L	5.0	1		06/13/19 20:56	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:56	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		06/13/19 20:56	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		06/13/19 20:56	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		06/13/19 20:56	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		06/13/19 20:56	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		06/13/19 20:56	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		06/13/19 20:56	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		06/13/19 20:56	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		06/13/19 20:56	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		06/13/19 20:56	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		06/13/19 20:56	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	102	%.	80-122	1		06/13/19 20:56	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	85-114	1		06/13/19 20:56	460-00-4	
Toluene-d8 (S)	97	%.	85-114	1		06/13/19 20:56	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

QC Batch: 506310 Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50227291010, 50227291011, 50227291012, 50227291013, 50227291014, 50227291015, 50227291016, 50227291017, 50227291018, 50227291019

METHOD BLANK: 2336220 Matrix: Water
Associated Lab Samples: 50227291010, 50227291011, 50227291012, 50227291013, 50227291014, 50227291015, 50227291016, 50227291017, 50227291018, 50227291019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	06/13/19 13:19	
1,1,1-Trichloroethane	ug/L	ND	5.0	06/13/19 13:19	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	06/13/19 13:19	
1,1,2-Trichloroethane	ug/L	ND	5.0	06/13/19 13:19	
1,1-Dichloroethane	ug/L	ND	5.0	06/13/19 13:19	
1,1-Dichloroethene	ug/L	ND	5.0	06/13/19 13:19	
1,1-Dichloropropene	ug/L	ND	5.0	06/13/19 13:19	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	06/13/19 13:19	
1,2,3-Trichloropropane	ug/L	ND	5.0	06/13/19 13:19	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	06/13/19 13:19	
1,2,4-Trimethylbenzene	ug/L	ND	5.0	06/13/19 13:19	
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	06/13/19 13:19	
1,2-Dichlorobenzene	ug/L	ND	5.0	06/13/19 13:19	
1,2-Dichloroethane	ug/L	ND	5.0	06/13/19 13:19	
1,2-Dichloropropane	ug/L	ND	5.0	06/13/19 13:19	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	06/13/19 13:19	
1,3-Dichlorobenzene	ug/L	ND	5.0	06/13/19 13:19	
1,3-Dichloropropane	ug/L	ND	5.0	06/13/19 13:19	
1,4-Dichlorobenzene	ug/L	ND	5.0	06/13/19 13:19	
1-Methylnaphthalene	ug/L	ND	10.0	06/13/19 13:19	N2
2,2-Dichloropropane	ug/L	ND	5.0	06/13/19 13:19	
2-Butanone (MEK)	ug/L	ND	25.0	06/13/19 13:19	
2-Chlorotoluene	ug/L	ND	5.0	06/13/19 13:19	
2-Hexanone	ug/L	ND	25.0	06/13/19 13:19	
2-Methylnaphthalene	ug/L	ND	10.0	06/13/19 13:19	
4-Chlorotoluene	ug/L	ND	5.0	06/13/19 13:19	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	06/13/19 13:19	
Acetone	ug/L	ND	100	06/13/19 13:19	
Acrolein	ug/L	ND	50.0	06/13/19 13:19	
Acrylonitrile	ug/L	ND	100	06/13/19 13:19	
Benzene	ug/L	ND	5.0	06/13/19 13:19	
Bromobenzene	ug/L	ND	5.0	06/13/19 13:19	
Bromochloromethane	ug/L	ND	5.0	06/13/19 13:19	
Bromodichloromethane	ug/L	ND	5.0	06/13/19 13:19	
Bromoform	ug/L	ND	5.0	06/13/19 13:19	
Bromomethane	ug/L	ND	5.0	06/13/19 13:19	
Carbon disulfide	ug/L	ND	10.0	06/13/19 13:19	
Carbon tetrachloride	ug/L	ND	5.0	06/13/19 13:19	
Chlorobenzene	ug/L	ND	5.0	06/13/19 13:19	
Chloroethane	ug/L	ND	5.0	06/13/19 13:19	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

METHOD BLANK: 2336220 Matrix: Water

Associated Lab Samples: 50227291010, 50227291011, 50227291012, 50227291013, 50227291014, 50227291015, 50227291016, 50227291017, 50227291018, 50227291019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloroform	ug/L	ND	5.0	06/13/19 13:19	
Chloromethane	ug/L	ND	5.0	06/13/19 13:19	
cis-1,2-Dichloroethene	ug/L	ND	5.0	06/13/19 13:19	
cis-1,3-Dichloropropene	ug/L	ND	5.0	06/13/19 13:19	
Dibromochloromethane	ug/L	ND	5.0	06/13/19 13:19	
Dibromomethane	ug/L	ND	5.0	06/13/19 13:19	
Dichlorodifluoromethane	ug/L	ND	5.0	06/13/19 13:19	
Ethyl methacrylate	ug/L	ND	100	06/13/19 13:19	
Ethylbenzene	ug/L	ND	5.0	06/13/19 13:19	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	06/13/19 13:19	
Iodomethane	ug/L	ND	10.0	06/13/19 13:19	
Isopropylbenzene (Cumene)	ug/L	ND	5.0	06/13/19 13:19	
Methyl-tert-butyl ether	ug/L	ND	4.0	06/13/19 13:19	
Methylene Chloride	ug/L	ND	5.0	06/13/19 13:19	
n-Butylbenzene	ug/L	ND	5.0	06/13/19 13:19	
n-Hexane	ug/L	ND	5.0	06/13/19 13:19	
n-Propylbenzene	ug/L	ND	5.0	06/13/19 13:19	
Naphthalene	ug/L	ND	1.7	06/13/19 13:19	
p-Isopropyltoluene	ug/L	ND	5.0	06/13/19 13:19	
sec-Butylbenzene	ug/L	ND	5.0	06/13/19 13:19	
Styrene	ug/L	ND	5.0	06/13/19 13:19	
tert-Butylbenzene	ug/L	ND	5.0	06/13/19 13:19	
Tetrachloroethene	ug/L	ND	5.0	06/13/19 13:19	
Toluene	ug/L	ND	5.0	06/13/19 13:19	
trans-1,2-Dichloroethene	ug/L	ND	5.0	06/13/19 13:19	
trans-1,3-Dichloropropene	ug/L	ND	5.0	06/13/19 13:19	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	06/13/19 13:19	
Trichloroethene	ug/L	ND	5.0	06/13/19 13:19	
Trichlorofluoromethane	ug/L	ND	5.0	06/13/19 13:19	
Vinyl acetate	ug/L	ND	50.0	06/13/19 13:19	
Vinyl chloride	ug/L	ND	2.0	06/13/19 13:19	
Xylene (Total)	ug/L	ND	10.0	06/13/19 13:19	
4-Bromofluorobenzene (S)	%.	102	85-114	06/13/19 13:19	
Dibromofluoromethane (S)	%.	102	80-122	06/13/19 13:19	
Toluene-d8 (S)	%.	95	85-114	06/13/19 13:19	

LABORATORY CONTROL SAMPLE: 2336221

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.0	98	78-120	
1,1,1-Trichloroethane	ug/L	50	50.4	101	72-127	
1,1,2,2-Tetrachloroethane	ug/L	50	43.9	88	70-124	
1,1,2-Trichloroethane	ug/L	50	46.4	93	79-121	

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QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

LABORATORY CONTROL SAMPLE: 2336221

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	50	35.8	72	70-119	
1,1-Dichloroethene	ug/L	50	47.8	96	71-126	
1,1-Dichloropropene	ug/L	50	47.1	94	76-122	
1,2,3-Trichlorobenzene	ug/L	50	45.9	92	71-126	
1,2,3-Trichloropropane	ug/L	50	47.0	94	75-119	
1,2,4-Trichlorobenzene	ug/L	50	49.6	99	68-130	
1,2,4-Trimethylbenzene	ug/L	50	45.2	90	79-117	
1,2-Dibromoethane (EDB)	ug/L	50	51.0	102	81-119	
1,2-Dichlorobenzene	ug/L	50	45.3	91	78-114	
1,2-Dichloroethane	ug/L	50	44.3	89	68-119	
1,2-Dichloropropane	ug/L	50	47.0	94	79-126	
1,3,5-Trimethylbenzene	ug/L	50	44.8	90	78-118	
1,3-Dichlorobenzene	ug/L	50	46.4	93	77-114	
1,3-Dichloropropane	ug/L	50	48.6	97	82-124	
1,4-Dichlorobenzene	ug/L	50	44.6	89	77-111	
1-Methylnaphthalene	ug/L	50	50.1	100	60-140	N2
2,2-Dichloropropane	ug/L	50	46.8	94	53-137	
2-Butanone (MEK)	ug/L	250	222	89	62-140	
2-Chlorotoluene	ug/L	50	43.4	87	76-120	
2-Hexanone	ug/L	250	222	89	62-143	
2-Methylnaphthalene	ug/L	50	48.5	97	60-133	
4-Chlorotoluene	ug/L	50	45.4	91	78-114	
4-Methyl-2-pentanone (MIBK)	ug/L	250	228	91	60-143	
Acetone	ug/L	250	215	86	44-156	
Acrolein	ug/L	1000	847	85	17-189	
Acrylonitrile	ug/L	200	167	83	58-139	
Benzene	ug/L	50	45.4	91	78-117	
Bromobenzene	ug/L	50	42.6	85	76-114	
Bromochloromethane	ug/L	50	46.3	93	70-122	
Bromodichloromethane	ug/L	50	44.9	90	72-121	
Bromoform	ug/L	50	46.3	93	66-117	
Bromomethane	ug/L	50	60.3	121	20-176	
Carbon disulfide	ug/L	50	43.5	87	65-124	
Carbon tetrachloride	ug/L	50	49.4	99	68-132	
Chlorobenzene	ug/L	50	47.4	95	79-113	
Chloroethane	ug/L	50	55.0	110	62-140	
Chloroform	ug/L	50	45.3	91	73-118	
Chloromethane	ug/L	50	34.7	69	36-132	
cis-1,2-Dichloroethene	ug/L	50	46.5	93	74-122	
cis-1,3-Dichloropropene	ug/L	50	49.7	99	79-126	
Dibromochloromethane	ug/L	50	51.2	102	75-121	
Dibromomethane	ug/L	50	45.8	92	75-123	
Dichlorodifluoromethane	ug/L	50	33.1	66	27-172	
Ethyl methacrylate	ug/L	200	188	94	72-134	
Ethylbenzene	ug/L	50	46.6	93	80-118	
Hexachloro-1,3-butadiene	ug/L	50	52.5	105	71-141	
Iodomethane	ug/L	100	95.4	95	10-186	

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QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

LABORATORY CONTROL SAMPLE: 2336221

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isopropylbenzene (Cumene)	ug/L	50	47.9	96	82-120	
Methyl-tert-butyl ether	ug/L	50	46.9	94	72-128	
Methylene Chloride	ug/L	50	49.3	99	70-121	
n-Butylbenzene	ug/L	50	45.9	92	76-123	
n-Hexane	ug/L	50	42.3	85	58-149	
n-Propylbenzene	ug/L	50	45.4	91	80-122	
Naphthalene	ug/L	50	46.8	94	71-121	
p-Isopropyltoluene	ug/L	50	47.3	95	79-121	
sec-Butylbenzene	ug/L	50	46.7	93	78-124	
Styrene	ug/L	50	45.6	91	80-119	
tert-Butylbenzene	ug/L	50	34.9	70	62-102	
Tetrachloroethene	ug/L	50	53.1	106	76-124	
Toluene	ug/L	50	47.9	96	78-116	
trans-1,2-Dichloroethene	ug/L	50	48.3	97	73-121	
trans-1,3-Dichloropropene	ug/L	50	47.1	94	73-126	
trans-1,4-Dichloro-2-butene	ug/L	200	161	81	42-138	
Trichloroethene	ug/L	50	47.0	94	76-120	
Trichlorofluoromethane	ug/L	50	57.4	115	60-138	
Vinyl acetate	ug/L	200	146	73	29-200	
Vinyl chloride	ug/L	50	42.1	84	70-136	
Xylene (Total)	ug/L	150	139	92	79-119	
4-Bromofluorobenzene (S)	%.			94	85-114	
Dibromofluoromethane (S)	%.			95	80-122	
Toluene-d8 (S)	%.			101	85-114	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2336222 2336223

Parameter	Units	50227291017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	51.2	53.5	102	107	44-142	4	20	
1,1,1-Trichloroethane	ug/L	ND	50	50	53.2	53.0	106	106	48-145	0	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	45.5	46.5	91	93	44-139	2	20	
1,1,2-Trichloroethane	ug/L	ND	50	50	49.8	53.7	100	107	49-140	8	20	
1,1-Dichloroethane	ug/L	ND	50	50	37.8	52.8	76	106	38-142	33	20	R1
1,1-Dichloroethene	ug/L	ND	50	50	48.4	52.3	97	105	46-148	8	20	
1,1-Dichloropropene	ug/L	ND	50	50	50.0	51.3	100	103	47-142	3	20	
1,2,3-Trichlorobenzene	ug/L	ND	50	50	45.0	47.3	90	95	34-139	5	20	
1,2,3-Trichloropropane	ug/L	ND	50	50	46.7	50.0	93	100	44-140	7	20	
1,2,4-Trichlorobenzene	ug/L	ND	50	50	47.4	48.1	95	96	31-142	1	20	
1,2,4-Trimethylbenzene	ug/L	ND	50	50	47.2	46.8	94	94	39-140	1	20	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	52.4	55.3	105	111	47-143	5	20	
1,2-Dichlorobenzene	ug/L	ND	50	50	48.3	48.7	97	97	40-135	1	20	
1,2-Dichloroethane	ug/L	ND	50	50	47.5	49.9	95	100	44-138	5	20	
1,2-Dichloropropane	ug/L	ND	50	50	49.1	51.2	98	102	53-142	4	20	
1,3,5-Trimethylbenzene	ug/L	ND	50	50	46.0	45.6	92	91	36-142	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical®
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Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2336222 2336223

Parameter	Units	50227291017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,3-Dichlorobenzene	ug/L	ND	50	50	47.3	47.6	95	95	37-136	1	20	
1,3-Dichloropropane	ug/L	ND	50	50	50.1	52.6	100	105	47-145	5	20	
1,4-Dichlorobenzene	ug/L	ND	50	50	45.8	46.5	92	93	38-132	1	20	
1-Methylnaphthalene	ug/L	ND	50	50	50.4	53.7	101	107	35-144	6	20	N2
2,2-Dichloropropane	ug/L	ND	50	50	49.5	50.0	99	100	19-147	1	20	
2-Butanone (MEK)	ug/L	ND	250	250	211	234	85	94	36-153	10	20	
2-Chlorotoluene	ug/L	ND	50	50	44.1	44.8	88	90	37-143	1	20	
2-Hexanone	ug/L	ND	250	250	206	236	83	94	38-149	13	20	
2-Methylnaphthalene	ug/L	ND	50	50	46.6	50.2	93	100	38-134	7	20	
4-Chlorotoluene	ug/L	ND	50	50	45.9	46.7	92	93	38-137	2	20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	250	210	245	84	98	43-145	15	20	
Acetone	ug/L	ND	250	250	221	234	85	90	21-161	6	20	
Acrolein	ug/L	ND	1000	1000	797	880	80	88	17-153	10	20	
Acrylonitrile	ug/L	ND	200	200	171	186	85	93	40-141	8	20	
Benzene	ug/L	ND	50	50	48.4	49.7	97	99	49-140	3	20	
Bromobenzene	ug/L	ND	50	50	46.4	48.7	93	97	39-137	5	20	
Bromochloromethane	ug/L	ND	50	50	52.1	50.6	104	101	50-132	3	20	
Bromodichloromethane	ug/L	ND	50	50	48.4	50.2	97	100	42-139	4	20	
Bromoform	ug/L	ND	50	50	46.2	47.0	92	94	29-135	2	20	
Bromomethane	ug/L	ND	50	50	65.7	68.6	131	137	10-162	4	20	
Carbon disulfide	ug/L	ND	50	50	47.2	47.1	94	94	33-144	0	20	
Carbon tetrachloride	ug/L	ND	50	50	50.6	51.8	101	104	45-148	2	20	
Chlorobenzene	ug/L	ND	50	50	49.9	52.1	100	104	47-135	4	20	
Chloroethane	ug/L	ND	50	50	57.5	60.4	115	121	41-149	5	20	
Chloroform	ug/L	ND	50	50	47.8	50.1	96	100	49-136	5	20	
Chloromethane	ug/L	ND	50	50	29.9	36.0	60	72	17-138	19	20	
cis-1,2-Dichloroethene	ug/L	ND	50	50	49.4	50.9	99	102	46-143	3	20	
cis-1,3-Dichloropropene	ug/L	ND	50	50	51.7	52.1	103	104	44-142	1	20	
Dibromochloromethane	ug/L	ND	50	50	52.4	55.3	105	111	41-141	5	20	
Dibromomethane	ug/L	ND	50	50	49.1	50.5	98	101	46-140	3	20	
Dichlorodifluoromethane	ug/L	ND	50	50	35.0	34.6	70	69	10-193	1	20	
Ethyl methacrylate	ug/L	ND	200	200	197	213	98	107	45-145	8	20	
Ethylbenzene	ug/L	ND	50	50	49.7	50.8	99	101	44-145	2	20	
Hexachloro-1,3-butadiene	ug/L	ND	50	50	52.5	51.3	105	103	27-158	2	20	
Iodomethane	ug/L	ND	100	100	104	103	104	103	10-172	1	20	
Isopropylbenzene (Cumene)	ug/L	ND	50	50	51.5	53.2	103	106	43-148	3	20	
Methyl-tert-butyl ether	ug/L	ND	50	50	49.8	51.4	100	103	38-158	3	20	
Methylene Chloride	ug/L	ND	50	50	56.4	55.3	113	111	33-140	2	20	
n-Butylbenzene	ug/L	ND	50	50	45.4	45.5	91	91	35-142	0	20	
n-Hexane	ug/L	ND	50	50	51.7	52.7	103	105	32-159	2	20	
n-Propylbenzene	ug/L	ND	50	50	46.1	45.6	92	91	37-145	1	20	
Naphthalene	ug/L	ND	50	50	48.4	51.6	97	103	40-137	6	20	
p-Isopropyltoluene	ug/L	ND	50	50	48.6	48.5	97	97	37-143	0	20	
sec-Butylbenzene	ug/L	ND	50	50	48.4	47.7	97	95	40-144	2	20	

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Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2336222 2336223

Parameter	Units	50227291017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Styrene	ug/L	ND	50	50	49.3	51.2	99	102	37-143	4	20	
tert-Butylbenzene	ug/L	ND	50	50	37.1	36.3	74	73	35-114	2	20	
Tetrachloroethene	ug/L	52.5	50	50	113	111	120	117	41-145	1	20	
Toluene	ug/L	ND	50	50	50.2	51.7	99	102	48-139	3	20	
trans-1,2-Dichloroethene	ug/L	ND	50	50	50.7	51.8	101	104	46-140	2	20	
trans-1,3-Dichloropropene	ug/L	ND	50	50	48.4	50.6	97	101	37-141	4	20	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	200	164	179	82	89	10-166	9	20	
Trichloroethene	ug/L	ND	50	50	49.8	50.7	100	101	43-147	2	20	
Trichlorofluoromethane	ug/L	ND	50	50	59.8	59.0	120	118	39-154	1	20	
Vinyl acetate	ug/L	ND	200	200	137	210	69	105	10-181	42	20	R1
Vinyl chloride	ug/L	ND	50	50	46.6	47.2	93	94	49-153	1	20	
Xylene (Total)	ug/L	ND	150	150	149	153	99	102	44-147	3	20	
4-Bromofluorobenzene (S)	%.						98	102	85-114			
Dibromofluoromethane (S)	%.						95	96	80-122			
Toluene-d8 (S)	%.						100	101	85-114			

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Pace Analytical Services, LLC
7726 Moller Road
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QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

QC Batch: 506062 | Analysis Method: EPA 8260
QC Batch Method: EPA 8260 | Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 50227291001, 50227291002, 50227291003, 50227291004, 50227291005, 50227291006, 50227291007, 50227291008, 50227291009

METHOD BLANK: 2334968 | Matrix: Solid
Associated Lab Samples: 50227291001, 50227291002, 50227291003, 50227291004, 50227291005, 50227291006, 50227291007, 50227291008, 50227291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	5.0	06/12/19 22:38	
1,1,1-Trichloroethane	ug/kg	ND	5.0	06/12/19 22:38	
1,1,2,2-Tetrachloroethane	ug/kg	ND	5.0	06/12/19 22:38	
1,1,2-Trichloroethane	ug/kg	ND	5.0	06/12/19 22:38	
1,1-Dichloroethane	ug/kg	ND	5.0	06/12/19 22:38	
1,1-Dichloroethene	ug/kg	ND	5.0	06/12/19 22:38	
1,1-Dichloropropene	ug/kg	ND	5.0	06/12/19 22:38	
1,2,3-Trichlorobenzene	ug/kg	ND	5.0	06/12/19 22:38	
1,2,3-Trichloropropane	ug/kg	ND	5.0	06/12/19 22:38	
1,2,4-Trichlorobenzene	ug/kg	ND	5.0	06/12/19 22:38	
1,2,4-Trimethylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
1,2-Dibromoethane (EDB)	ug/kg	ND	5.0	06/12/19 22:38	
1,2-Dichlorobenzene	ug/kg	ND	5.0	06/12/19 22:38	
1,2-Dichloroethane	ug/kg	ND	5.0	06/12/19 22:38	
1,2-Dichloropropane	ug/kg	ND	5.0	06/12/19 22:38	
1,3,5-Trimethylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
1,3-Dichlorobenzene	ug/kg	ND	5.0	06/12/19 22:38	
1,3-Dichloropropane	ug/kg	ND	5.0	06/12/19 22:38	
1,4-Dichlorobenzene	ug/kg	ND	5.0	06/12/19 22:38	
1-Methylnaphthalene	ug/kg	ND	10.0	06/12/19 22:38	N2
2,2-Dichloropropane	ug/kg	ND	5.0	06/12/19 22:38	
2-Butanone (MEK)	ug/kg	ND	25.0	06/12/19 22:38	
2-Chlorotoluene	ug/kg	ND	5.0	06/12/19 22:38	
2-Hexanone	ug/kg	ND	100	06/12/19 22:38	
2-Methylnaphthalene	ug/kg	ND	10.0	06/12/19 22:38	
4-Chlorotoluene	ug/kg	ND	5.0	06/12/19 22:38	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	25.0	06/12/19 22:38	
Acetone	ug/kg	ND	100	06/12/19 22:38	
Acrolein	ug/kg	ND	100	06/12/19 22:38	
Acrylonitrile	ug/kg	ND	100	06/12/19 22:38	
Benzene	ug/kg	ND	5.0	06/12/19 22:38	
Bromobenzene	ug/kg	ND	5.0	06/12/19 22:38	
Bromochloromethane	ug/kg	ND	5.0	06/12/19 22:38	
Bromodichloromethane	ug/kg	ND	5.0	06/12/19 22:38	
Bromoform	ug/kg	ND	5.0	06/12/19 22:38	
Bromomethane	ug/kg	ND	5.0	06/12/19 22:38	
Carbon disulfide	ug/kg	ND	10.0	06/12/19 22:38	
Carbon tetrachloride	ug/kg	ND	5.0	06/12/19 22:38	
Chlorobenzene	ug/kg	ND	5.0	06/12/19 22:38	
Chloroethane	ug/kg	ND	5.0	06/12/19 22:38	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

METHOD BLANK: 2334968 Matrix: Solid

Associated Lab Samples: 50227291001, 50227291002, 50227291003, 50227291004, 50227291005, 50227291006, 50227291007, 50227291008, 50227291009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloroform	ug/kg	ND	5.0	06/12/19 22:38	
Chloromethane	ug/kg	ND	5.0	06/12/19 22:38	
cis-1,2-Dichloroethene	ug/kg	ND	5.0	06/12/19 22:38	
cis-1,3-Dichloropropene	ug/kg	ND	5.0	06/12/19 22:38	
Dibromochloromethane	ug/kg	ND	5.0	06/12/19 22:38	
Dibromomethane	ug/kg	ND	5.0	06/12/19 22:38	
Dichlorodifluoromethane	ug/kg	ND	5.0	06/12/19 22:38	
Ethyl methacrylate	ug/kg	ND	100	06/12/19 22:38	
Ethylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
Hexachloro-1,3-butadiene	ug/kg	ND	5.0	06/12/19 22:38	
Iodomethane	ug/kg	ND	100	06/12/19 22:38	
Isopropylbenzene (Cumene)	ug/kg	ND	5.0	06/12/19 22:38	
Methyl-tert-butyl ether	ug/kg	ND	5.0	06/12/19 22:38	
Methylene Chloride	ug/kg	ND	20.0	06/12/19 22:38	
n-Butylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
n-Hexane	ug/kg	ND	5.0	06/12/19 22:38	
n-Propylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
Naphthalene	ug/kg	ND	5.0	06/12/19 22:38	
p-Isopropyltoluene	ug/kg	ND	5.0	06/12/19 22:38	
sec-Butylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
Styrene	ug/kg	ND	5.0	06/12/19 22:38	
tert-Butylbenzene	ug/kg	ND	5.0	06/12/19 22:38	
Tetrachloroethene	ug/kg	ND	5.0	06/12/19 22:38	
Toluene	ug/kg	ND	5.0	06/12/19 22:38	
trans-1,2-Dichloroethene	ug/kg	ND	5.0	06/12/19 22:38	
trans-1,3-Dichloropropene	ug/kg	ND	5.0	06/12/19 22:38	
trans-1,4-Dichloro-2-butene	ug/kg	ND	100	06/12/19 22:38	
Trichloroethene	ug/kg	ND	5.0	06/12/19 22:38	
Trichlorofluoromethane	ug/kg	ND	5.0	06/12/19 22:38	
Vinyl acetate	ug/kg	ND	100	06/12/19 22:38	
Vinyl chloride	ug/kg	ND	5.0	06/12/19 22:38	
Xylene (Total)	ug/kg	ND	10.0	06/12/19 22:38	
4-Bromofluorobenzene (S)	%.	100	65-119	06/12/19 22:38	
Dibromofluoromethane (S)	%.	99	77-131	06/12/19 22:38	
Toluene-d8 (S)	%.	96	77-127	06/12/19 22:38	

LABORATORY CONTROL SAMPLE: 2334969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	50	48.2	96	81-122	
1,1,1-Trichloroethane	ug/kg	50	52.7	105	72-125	
1,1,2,2-Tetrachloroethane	ug/kg	50	41.9	84	70-124	
1,1,2-Trichloroethane	ug/kg	50	46.0	92	77-122	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

LABORATORY CONTROL SAMPLE: 2334969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/kg	50	47.6	95	69-116	
1,1-Dichloroethene	ug/kg	50	46.3	93	70-127	
1,1-Dichloropropene	ug/kg	50	46.7	93	72-122	
1,2,3-Trichlorobenzene	ug/kg	50	36.8	74	56-118	
1,2,3-Trichloropropane	ug/kg	50	43.8	88	71-124	
1,2,4-Trichlorobenzene	ug/kg	50	37.6	75	50-123	
1,2,4-Trimethylbenzene	ug/kg	50	40.6	81	69-117	
1,2-Dibromoethane (EDB)	ug/kg	50	46.6	93	77-126	
1,2-Dichlorobenzene	ug/kg	50	41.1	82	73-115	
1,2-Dichloroethane	ug/kg	50	45.9	92	72-120	
1,2-Dichloropropane	ug/kg	50	48.0	96	77-125	
1,3,5-Trimethylbenzene	ug/kg	50	40.7	81	69-114	
1,3-Dichlorobenzene	ug/kg	50	40.7	81	66-115	
1,3-Dichloropropane	ug/kg	50	47.4	95	82-122	
1,4-Dichlorobenzene	ug/kg	50	38.8	78	66-114	
1-Methylnaphthalene	ug/kg	50	43.6	87	52-128	N2
2,2-Dichloropropane	ug/kg	50	46.7	93	60-126	
2-Butanone (MEK)	ug/kg	250	205	82	57-145	
2-Chlorotoluene	ug/kg	50	41.3	83	71-117	
2-Hexanone	ug/kg	250	196	78	64-127	
2-Methylnaphthalene	ug/kg	50	39.6	79	43-126	
4-Chlorotoluene	ug/kg	50	39.7	79	67-115	
4-Methyl-2-pentanone (MIBK)	ug/kg	250	207	83	60-123	
Acetone	ug/kg	250	197	79	33-174	
Acrolein	ug/kg	1000	651	65	11-200	
Acrylonitrile	ug/kg	200	151	75	64-123	
Benzene	ug/kg	50	45.8	92	74-119	
Bromobenzene	ug/kg	50	40.5	81	73-114	
Bromochloromethane	ug/kg	50	44.8	90	70-118	
Bromodichloromethane	ug/kg	50	47.6	95	73-120	
Bromoform	ug/kg	50	45.4	91	65-118	
Bromomethane	ug/kg	50	49.3	99	37-160	
Carbon disulfide	ug/kg	50	43.3	87	65-123	
Carbon tetrachloride	ug/kg	50	50.3	101	71-125	
Chlorobenzene	ug/kg	50	44.3	89	76-113	
Chloroethane	ug/kg	50	35.2	70	59-148	
Chloroform	ug/kg	50	45.5	91	71-117	
Chloromethane	ug/kg	50	38.7	77	49-112	
cis-1,2-Dichloroethene	ug/kg	50	47.3	95	70-122	
cis-1,3-Dichloropropene	ug/kg	50	48.5	97	75-120	
Dibromochloromethane	ug/kg	50	48.1	96	78-121	
Dibromomethane	ug/kg	50	47.1	94	75-125	
Dichlorodifluoromethane	ug/kg	50	31.0	62	34-163	
Ethyl methacrylate	ug/kg	200	190	95	63-132	
Ethylbenzene	ug/kg	50	43.5	87	73-118	
Hexachloro-1,3-butadiene	ug/kg	50	40.5	81	61-121	
Iodomethane	ug/kg	100	109	109	71-143	

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REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
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QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

LABORATORY CONTROL SAMPLE: 2334969

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isopropylbenzene (Cumene)	ug/kg	50	44.1	88	74-121	
Methyl-tert-butyl ether	ug/kg	50	48.6	97	74-131	
Methylene Chloride	ug/kg	50	50.2	100	67-128	
n-Butylbenzene	ug/kg	50	36.3	73	61-116	
n-Hexane	ug/kg	50	42.3	85	59-119	
n-Propylbenzene	ug/kg	50	40.8	82	70-115	
Naphthalene	ug/kg	50	41.1	82	63-123	
p-Isopropyltoluene	ug/kg	50	41.3	83	68-117	
sec-Butylbenzene	ug/kg	50	42.4	85	72-117	
Styrene	ug/kg	50	44.4	89	75-120	
tert-Butylbenzene	ug/kg	50	33.5	67	55-100	
Tetrachloroethene	ug/kg	50	43.7	87	70-116	
Toluene	ug/kg	50	44.6	89	72-112	
trans-1,2-Dichloroethene	ug/kg	50	47.2	94	70-120	
trans-1,3-Dichloropropene	ug/kg	50	45.9	92	67-119	
trans-1,4-Dichloro-2-butene	ug/kg	200	157	79	57-124	
Trichloroethene	ug/kg	50	46.5	93	74-120	
Trichlorofluoromethane	ug/kg	50	40.6	81	59-139	
Vinyl acetate	ug/kg	200	142	71	70-134	
Vinyl chloride	ug/kg	50	40.9	82	58-133	
Xylene (Total)	ug/kg	150	131	88	71-119	
4-Bromofluorobenzene (S)	%.			96	65-119	
Dibromofluoromethane (S)	%.			99	77-131	
Toluene-d8 (S)	%.			101	77-127	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

QC Batch: 505738 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 50227291001, 50227291002

SAMPLE DUPLICATE: 2333513

Parameter	Units	50226645001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.0	8.0	0	5	

SAMPLE DUPLICATE: 2333514

Parameter	Units	50227045004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	19.2	19.6	2	5	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Depot
Pace Project No.: 50227291

QC Batch: 505756 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 50227291003, 50227291004, 50227291005, 50227291006, 50227291007, 50227291008, 50227291009

SAMPLE DUPLICATE: 2333586

Parameter	Units	50226687004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.6	7.4	3	5	

SAMPLE DUPLICATE: 2333587

Parameter	Units	50226687012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.8	18.9	1	5	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALIFIERS

Project: O'Neals Depot
Pace Project No.: 50227291

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-I Pace Analytical Services - Indianapolis

ANALYTE QUALIFIERS

N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: O'Neals Depot
Pace Project No.: 50227291

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50227291010	**B-68_WG_190606**	EPA 5030/8260	506310		
50227291011	**B-69_WG_190606**	EPA 5030/8260	506310		
50227291012	**B-70_WG_190606**	EPA 5030/8260	506310		
50227291013	**B-71_WG_190606**	EPA 5030/8260	506310		
50227291014	**B-72_WG_190606**	EPA 5030/8260	506310		
50227291015	**B-73_WG_190606**	EPA 5030/8260	506310		
50227291016	**B-74_WG_190606**	EPA 5030/8260	506310		
50227291017	**B-75_WG_190606**	EPA 5030/8260	506310		
50227291018	**Dup-01_WG_190606**	EPA 5030/8260	506310		
50227291019	**TB-01_SO_190606**	EPA 5030/8260	506310		
50227291001	**B-68_SO_4-5ft_190606**	EPA 8260	506062		
50227291002	**B-69_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291003	**B-70_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291004	**B-71_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291005	**B-72_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291006	**B-73_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291007	**B-74_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291008	**B-75_SO_9-9.5ft_190606**	EPA 8260	506062		
50227291009	**Dup-01_SO_190606**	EPA 8260	506062		
50227291001	**B-68_SO_4-5ft_190606**	SM 2540G	505738		
50227291002	**B-69_SO_9-9.5ft_190606**	SM 2540G	505738		
50227291003	**B-70_SO_9-9.5ft_190606**	SM 2540G	505756		
50227291004	**B-71_SO_9-9.5ft_190606**	SM 2540G	505756		
50227291005	**B-72_SO_9-9.5ft_190606**	SM 2540G	505756		
50227291006	**B-73_SO_9-9.5ft_190606**	SM 2540G	505756		
50227291007	**B-74_SO_9-9.5ft_190606**	SM 2540G	505756		
50227291008	**B-75_SO_9-9.5ft_190606**	SM 2540G	505756		
50227291009	**Dup-01_SO_190606**	SM 2540G	505756		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 2

2174480

Section A Required Client Information:

Company:	Wilcox Environmental Eng
Address:	1552 Main Street, Speedway, IN 46224
Email To:	GAlbey @wilcoxenv.com
Phone:	317-472-0999 Fax:
Requested Due Date/TAT:	Normal

Section B Required Project Information:

Report To:	GAlbey @wilcoxenv.com
Copy To:	
Purchase Order No.:	
Project Name:	O'Neals Clothes Depot
Project Number:	341.14

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Mark Davis
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER ____

Site Location STATE: IN

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Analysis Test: ~~cVOCs (8260)~~ Full VOCs per Greg Albey 6/7/19

Pace Project No./ Lab I.D.: 50227291

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-68-SO_~~4-4.5~~ft-190606	SL	G			6-6-19	945		4	X						X	X			001
2	SB-69-SO_9-9.5ft_190606	↓	↓			↓	1020		↓	↓						↓	↓			002
3	SB-70-SO_9-9.5ft-190606						1050													003
4	SB-71-SO_9-9.5ft-190606						1130													004
5	SB-72-SO_9-9.5ft_190606						1305													005
6	SB-73-SO_9-9.5ft-190606						1400													006
7	SB-74-SO-9-9.5ft_190606						1500													007
8	SB-75-SO_9-9.5ft_190606						1555													008
9	Dup-01-SO-190606						2359													009
10	SB-68_~~WG~~_190606	WT					955		3				X							010
11	SB-69_WG_190606	↓					1035						↓							011
12	SB-70_WG_190606	↓	↓			↓	1104		↓				↓							012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Oliver Purcell / Wilcox	6-7-19	855	Jason [illegible]	6-7	855	3.3	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Oliver Purcell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6-7-19

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 2 of 2

2174481

Section A
Required Client Information:

Company:	Wilcox Environmental Eng.
Address:	1552 Main Street
	Speedway IN 46224
Email To:	GAlfrey@wilcoxenv.com
Phone:	317-472-0995 Fax:
Requested Due Date/TAT:	Normal

Section B
Required Project Information:

Report To:	GAlfrey@wilcoxenv.com
Copy To:	
Purchase Order No.:	
Project Name:	O'Neals Clothes Depot
Project Number:	341.14

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Mark Davis
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER

Site Location STATE: IN

Section D **Required** Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

Analysis Test: VOCs (8260) Full VOCs per Greg Alfrey

Pace Project No./ Lab I.D.: 50227291

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	VOCs (8260) Full VOCs per Greg Alfrey	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-71-W6-190606	WT	G			6-6-19	1142		3				X					X		013
2	SB-72-W6-190606						1319		2											014
3	SB-73-W6-190606						1430		2											015
4	SB-74-W6-190606						1520		3											016
5	SB-75-W6-190606						1615													017
6	Dup-01-W6-190606						2359													018
7	TB-01-SO-190606																			019
8																				
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Oliver Parcell / Wilcox	6-7-19	855	Jason [illegible]	6-7	855	3.3	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Oliver Parcell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 6-7-19

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50227291

Date/Time and Initials of person examining contents: LWG 1230 6/7/19

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ Other ____

Tracking #: ____

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No   Seals Intact: ☐ Yes ☒ No

Packing Material: ☐ Bubble Wrap ~~☒ Bubble Bags~~ JHC-7 ☒ None ☐ Other ____

Thermometer: 1 2 3 4 5 6 A B C D E F   Ice Type: ☒ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☐ No ☒ N/A

Cooler Temperature: 3.3/3.3   Ice Visible in Sample Containers?: ☐ Yes ☒ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C   If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☒ N/A

All discrepancies will be written out in the comments section below.

	Yes	No
Are samples from West Virginia? Document any containers out of temp.		✓
USDA Regulated Soils? (ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓
Chain of Custody Present:	✓	
Chain of Custody Filled Out:	✓	
Short Hold Time Analysis (<72hr)?: Analysis: TC	X	
Time 5035A TC placed in Freezer or Short Holds To Lab: 1235		
Rush TAT Requested:		✓
Containers Intact?:	✓	
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID		✓

	Yes	No	N/A
All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted. Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			✓
Dissolved Metals field filtered?:			✓
Headspace Wisconsin Sulfide			✓
	Present	Absent	N/A
Residual Chlorine Check (SVOC 625 Pest/PCB 608)			✓
Residual Chlorine Check (Total/Amenable/Free Cyanide)			✓
Headspace in VOA Vials (>6mm):	✓		
Trip Blank Present?:	✓		
Trip Blank Custody Seals?:	✓		

Comments: H.S >6mm SB 68 WG - 1/3, SB 69-WG 3/3, SB-71-WG-3/3, SB-73 3/3, SB-74 1/2, Dup01 3/3
Samples do not match COC SB-74-9-9.5 ft on COC recieved SB-74-9-10 ft on Sample R 4/4, SB-75-9-9.5 ft on COC and recieved SB-75 9-10 ft R 4/4, Sample not labeled assuming SB-73-9-9.5 ft

→ This assumption OK per client Greg Alfrey 6/7/19 KH
Run VOCs with headspace and Qualify accordingly per Greg Alfrey Call 6/7/19.

Sample Container Count

CLIENT: W:lcox Env.

COC PAGE 1 of 2

COC ID# 2174480

Project # 50227291

Sample Line Item	DG9H	VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R (SBS / Bulk Kit / DI)				Matrix Sl/Wt/NAL (Soil/Water/Non-Aqueous Liquid)	pH <2	pH >9	pH>12
1																		4				SL			
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10	3																					WT			
11																									
12																									

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO_3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H_2SO_4 amber glass	BP1S	1 liter H_2SO_4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H_2SO_4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO_3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H_2SO_4 amber glass	BP2N	500mL HNO_3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H_2SO_4 glass amber	BP2S	500mL H_2SO_4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H_2SO_4 clear glass	BP3B	250mL NaOH plastic		
WGKU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO_3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H_2SO_4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

F-IN-Q-270-rev.10,31Aug2017

WO#: 50227291

50227291

Sample Container Count

CLIENT: Wilcox

COC PAGE 2 of 2

COC ID# 2174481

Project # 50227291

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	SBS Bulk Kit R				Matrix S/ (Soil/Wate Aqueous	pH <2	pH >9	pH>12
1	3																				WT			
2	2																							
3	3																							
4	2																							
5	3																							
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGKU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

APPENDIX B

Operations Maintenance and Monitoring Log Form

Operation, Maintenance, and Monitoring Log

Site Name/Address: Facility ID:

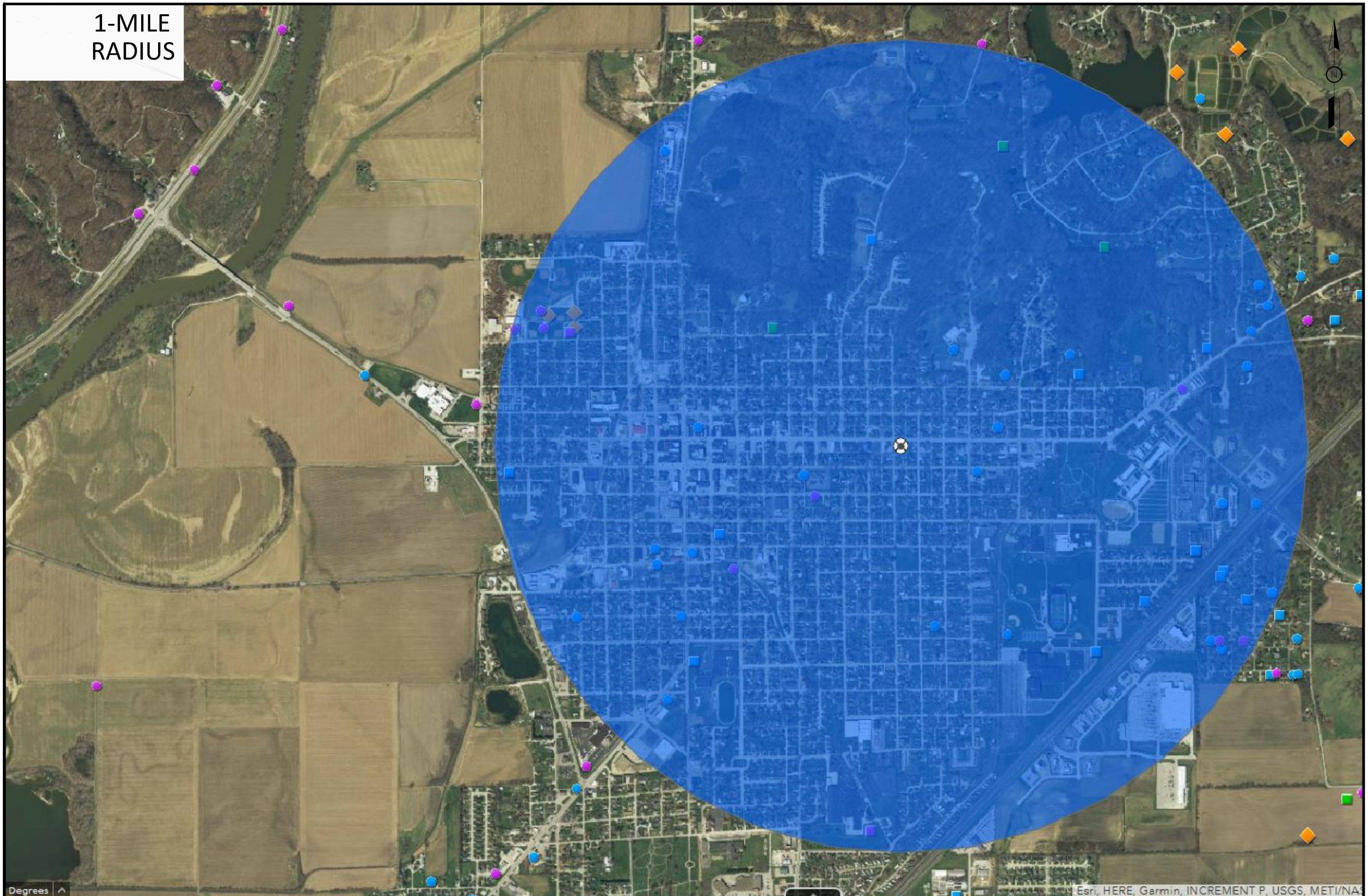
System being maintained (circle one): Sub-Slab Mitigation Soil Vapor Extraction Air Sparge Other:

Inspection Date	Inspector Name	Crawl Space Vapor Barrier	Vapor Mitigation System	Sub-Slab Pressure IWC	Manometer Reading IWC	Recommendations for Repair or Maintenance	Previous recommendations implemented?
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				
		☐ Intact ☐ Repairs Needed	☐ Operating ☐ Not Functioning				

Notes:
IWC = inches of water column

APPENDIX F

IDNR Water Well Records and Map

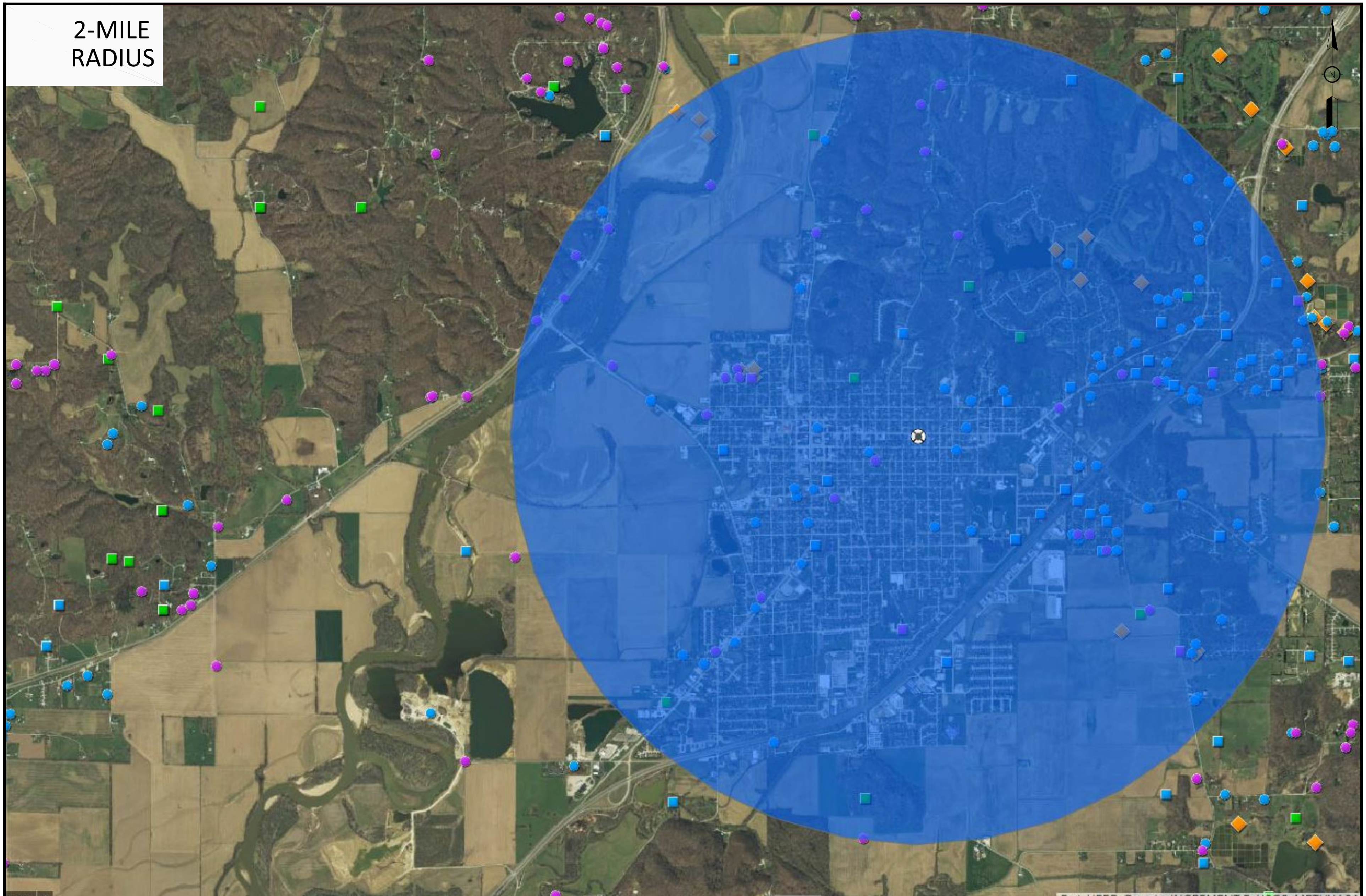


WILCOX
ENVIRONMENTAL ENGINEERING

IDNR WATER WELL MAP - 1 MILE RADIUS
APPENDIX - F

O'NEALS CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, INDIANA

WILCOX PROJECT #	SCALE
341.14	NOT TO SCALE
PROJECT MANAGER	DATE
J. KINMAN	10/17/18
FILE NO.	FIGURE NO.
34114008	1



WILCOX™
ENVIRONMENTAL ENGINEERING

IDNR WATER WELL MAP - 2 MILE RADIUS
APPENDIX - F

O'NEALS CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, INDIANA

WILCOX PROJECT #	SCALE
341.14	NOT TO SCALE
PROJECT MANAGER	DATE
J. KINMAN	10/17/18
FILE NO.	FIGURE NO.
34114009	1

Appendix F. IDNR Water Well Records
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well Log ID	Aquifer Elevation	Bailing Rate	Depth to Bedrock	Bedrock Elevation	Pump Rate	Screen Length	Static Water Level	Total Well Depth	Casing Length	Owner	Owner Address	UTM Northing NAD83	UTM Easting NAD 83	County	Topo Quad	Use
Wells Drilled to Bedrock																
15153	0	0	98	0	130	0	24			Morgan County REMC	IN MARTINSVILLE 300 MORTON AVE	4362900.0	572455.2	MORGAN	MARTINSVILLE	O
205385	0	0	60	0	0	0	0	102		TOM LACHET		4365766.0	550361.0	MORGAN	MARTINSVILLE	I
205390	0	0	20	0	100	10	29	135	25	CALDWELL	1380 LINCOLN HILL RD, MARTINSVILLE; 37 TO MORGAN TO 1ST R	4366425.0	550090.0	MORGAN	MARTINSVILLE	?
205650	0	0	95	0	100	10	29	120	95	LESTER HARNESS	1201 N DELAWARE ST INDPLS IN	4404037.4	572455.2	MORGAN	MARTINSVILLE	H
205655			83	626	270		52	83	57	CITY OF MARTINSVILLE				MORGAN	MARTINSVILLE	PS
205670		20	82	641	20				62	CITY OF MARTINSVILLE		4364701.0	548616.0	MORGAN	MARTINSVILLE	?
205690	612		81			20	34			CITY OF MARTINSVILLE		4364701.0	548616.0	MORGAN	MARTINSVILLE	?
205695	0	0	84	604	0	0	0	84	44	CITY OF MARTINSVILLE		4364630.0	548630.0	MORGAN	MARTINSVILLE	?
205700			89	600	429	43	54	118		CRONE LUMBER CO.		4403204.4	548513.0	MORGAN	MARTINSVILLE	?
206007			190	613	60		60	190	190	JOE MEREDITH		4364680.0	551664.0	MORGAN	MARTINSVILLE	H
206022			30	620	500		60	30	30	HARRY E DOW	R4, MARTINSVILLE, IN	4364618.0	551939.0	MORGAN	MARTINSVILLE	H
206057			241	625				241	238	WALTER KOGMAR	35 N JEFF, MARTINSVILLE	4402664.4	573214.2	MORGAN	MARTINSVILLE	?
206732			98	612	40			25	21	US GEOLOGICAL SURVEY	1819 N MERIDIAN ST, INDPLS, IN	4364330.0	548366.0	MORGAN	MARTINSVILLE	?
206762	643		35				24	82		HARRY HUBBLE	1489 BLUE BLUFF RD	4365968.0	549630.0	MORGAN	MARTINSVILLE	H
206772	644		42				24	42		JOHN NEWMAN	BLUE BLUFF RD	4365773.0	549233.0	MORGAN	MARTINSVILLE	H
207290	621		97		10	4	17	120	120	JOHN FEWEL	2510 ST RD 252	4363411.0	551323.0	MORGAN	MARTINSVILLE	H
207293			100	615		15	40	24	21	US GEOLOGICAL SURVEY	1819 N MERIDIAN ST, INDPLS, IN			MORGAN	MARTINSVILLE	O
207295	601		70		400	10	45	75	77	MIKE FEWELL	2510 ST RD 252, MARTINSVILLE	4363412.0	551414.0	MORGAN	MARTINSVILLE	H
207303			114	607	350		38	925	126	HOME LAWN SANATORIUM	MARTINSVILLE, IN	4363977.0	549707.0	MORGAN	MARTINSVILLE	O
207400	0	0	100	0	50	10	27	100		MARTINSVILLE WW	MARTINSVILLE	4363684.0	549390.0	MORGAN	MARTINSVILLE	?
208166	0	0	133	0	100	15	28	23		US GEOLOGICAL SURVEY	1819 N MERIDIAN ST, INDPLS, IN	4362815.0	551896.0	MORGAN	MARTINSVILLE	O
208226	665		107		837	15	32	107	107	VERN BOWAN	840 S CHERRY MARTINSVILLE	4363284.0	551548.0	MORGAN	MARTINSVILLE	?
Unconsolidated Wells																
14489	0	0	0	0	150	0	41	90	40	DON RIGGS				MORGAN	MARTINSVILLE	H
15152	0	0	0	0	60	4	15	20	10	UNITED GAS CO.	105 MORTEN AVE MARTINSVILLE	4363165.0	549130.0	MORGAN	MARTINSVILLE	O
15154	0	100	0	0	0	5	30	15	5	JOHNSON OIL CO.	339 S MAIN ST MARTINSVILLE	4363750.0	549220.0	MORGAN	MARTINSVILLE	O
15155	0	0	0	0	0	5	30	15	5	JOHNSON OIL CO.	339 S MAIN ST MARTINSVILLE			MORGAN	MARTINSVILLE	O
15156	0	0	0	0	0	5	30	15	5	JOHNSON OIL CO.	339 S MAIN ST MARTINSVILLE			MORGAN	MARTINSVILLE	O
15157	0	0	0	0	0	0	0	40	37	LEROY MATHANA	409 W SUMNER	4363490.0	548765.0	MORGAN	MARTINSVILLE	H
15175	0	0	0	0	0	0	60	220	216	ROBERT GARNER		4364550.0	552225.0	MORGAN	MARTINSVILLE	H
17897	0	0	0	0	10	4	10	95	92	MARVEL BROS.	LOT 27 CADET MANOR			MORGAN	MARTINSVILLE	H
18006	0	0	0	0	80	0	66	90	90	DON RIGGS	460 FLAIR AVE MARTINSVILLE IN			MORGAN	MARTINSVILLE	H
56457	0	0	0	0	0	0	45	82	82	DON RIGGS	450 EDNA ST, MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
56458	0	0	0	625	251	0	90	82	82	TODD STAFFORD	425 EDNA ST MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
56514	0	0	0	0	50	3	0	162	159	FRED COLLIER	3335 SR 44, MARTINSVILLE,			MORGAN	MARTINSVILLE	H
86752	0	0	0	0	350	0	33	115	112	WILSON SMITH	1490 E HARRISON ST MARTINSVILLE	4364540.0	550720.0	MORGAN	MARTINSVILLE	H
205635	0	0	0	630	300	0	54	190		HUSSY FISHER		4364500.0	551421.0	MORGAN	MARTINSVILLE	?
205640	0	0	0	0	0	0	19	210		DEAR LOVE	HILLVIEW DRIVE	4364740.0	551500.0	MORGAN	MARTINSVILLE	H
205645	0	0	0	0	0	0	50	145	142	ROBERT HAMMONDS	R4, MARTINSVILLE, IN	4364856.0	551634.0	MORGAN	MARTINSVILLE	H
205655	0	0	0	0	50	0	32	185	180	MORMON CHURCH		4364820.0	551469.0	MORGAN	MARTINSVILLE	PS
205660	0	0	0	0	150	0	45	120	107	HARRY DOW	680 S GRANT ST, MARTINSVILLE, IN	4364637.0	551439.0	MORGAN	MARTINSVILLE	H
205675	0	40	0	0	0	4	50	42	42	ADAMS CLAY	MARTINSVILLE	4365335.0	549105.0	MORGAN	MARTINSVILLE	I
205680	0	0	0	633	10	0	0	52		ARTESIAN LAUNDRY	MARTINSVILLE	4364243.0	549244.0	MORGAN	MARTINSVILLE	?
205961	0	0	0	0	150	0	0	230	230	CARL CUMMINGS	MARTINSVILLE	4365099.0	552280.0	MORGAN	MARTINSVILLE	H
205962	0	0	0	0	300	0	0	180	117	LARRY WAMPLER	COPE, IN	4364484.0	552219.0	MORGAN	MARTINSVILLE	H
205963	0	0	0	0	150	0	16	208	205	FERRAND	MARTINSVILLE	4365033.0	552128.0	MORGAN	MARTINSVILLE	H
205972	0	0	0	0	100	0	0	195	193	SKIRUIN		4364545.0	552127.0	MORGAN	MARTINSVILLE	H
205973	0	0	0	0	0	0	0	242		JOE PINKSTON		4365277.0	551952.0	MORGAN	MARTINSVILLE	H
205976	0	0	0	0	35	0	0	240		JOHN P LAWSON	RR6, MARTINSVILLE			MORGAN	MARTINSVILLE	H
205982	0	0	0	0	60	0	0	75	75	RHODES		4364478.0	552268.0	MORGAN	MARTINSVILLE	H
206002	0	0	0	0	60	0	0	72	70	BUNTON	MARTINSVILLE	4364624.0	552018.0	MORGAN	MARTINSVILLE	H
206012	0	0	0	540	0	0	30	225	220	WARREN BUD MARTIN	VOILES RD, MARTINSVILLE, I	4364771.0	552018.0	MORGAN	MARTINSVILLE	H
206017	0	0	0	0	0	0	0	132	132	BAPTIST CHURCH	R4, MARTINSVILLE			MORGAN	MARTINSVILLE	?
206018	0	0	0	0	0	0	0	230	230	MILES & STRODE	RR3, MARTINSVILLE			MORGAN	MARTINSVILLE	H
206027	0	0	0	0	0	0	0	115		BOB BOLIN	MARTINSVILLE	4364618.0	551981.0	MORGAN	MARTINSVILLE	H
206037	0	0	0	0	0	0	0	135	135	EDMUND V MARTH	R4, MARTINSVILLE	4365264.0	552025.0	MORGAN	MARTINSVILLE	H
206042	0	0	0	0	0	0	0	123	123	FLOYD NE	RR6, MARTINSVILLE	4365313.0	552110.0	MORGAN	MARTINSVILLE	H
206046	0	0	0	0	0	0	0	230	230	MILES & STRODE	RR3, MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
206051	0	0	0	0	150	0	22	210	210	RAY STRODE	RR, MORGANTOWN			MORGAN	MARTINSVILLE	H
206052	0	0	0	0	20	0	0	220		ARTHUR BERRY	2343 YANDES			MORGAN	MARTINSVILLE	H
206056	0	0	0	0	20	0	60	225	220	ROY STRODE	RR2, MOGANTOWN, IN			MORGAN	MARTINSVILLE	H
206076	0	0	0	0	120	5	29	256	256	ASHINGTON TOWNSHIP FIRE DE		4364599.0	552377.0	MORGAN	MARTINSVILLE	H
206681	0	0	0	0	250	0	0	67		JAMES CUNNINGHAM (NOW HAMM	1260 E. HARRISON	4364455.0	550463.0	MORGAN	MARTINSVILLE	H
206686	0	0	0	0	0	0	70	24	21	US GEOLOGICAL SURVEY	1819 N MERIDIAN ST, INDPLS, IN	4364559.0	550256.0	MORGAN	MARTINSVILLE	O
206691	0	0	0	0	48	0	0	77	74	CHARLES BUSKIRK	809 E JACKSON ST, MARTINSVILLE			MORGAN	MARTINSVILLE	H
206696	0	0	0	0	200	0	0	86	83	BANK & TRUS		4364248.0	550432.0	MORGAN	MARTINSVILLE	PS
206712	0	0	0	0	503	15	12	46	46	BILO GAS STATION	MARTINSVILLE	4364440.0	547921.0	MORGAN	MARTINSVILLE	PS
206767			0					52	4	ROBERT BRIANT	1390 S HARRIETTE ST, MARTINS	4366511.0	549301.0	MORGAN	MARTINSVILLE	H
207285			0					69	67	AUTHOR RHOADE	MARTINSVILLE			MORGAN	MARTINSVILLE	?
207288			0					85		HOME LAWN MINERAL SPRINGS	MARTINSVILLE	4364056.0	549664.0	MORGAN	MARTINSVILLE	?
207300			0					94	90	ALVA MANIAS	MARTINSVILLE			MORGAN	MARTINSVILLE	?
207305			0					85	82	JOHN FEWELL	MARTINSVILLE			MORGAN	MARTINSVILLE	?
207310			0					73	73	JOHN FEWELL	MARTINSVILLE			MORGAN	MARTINSVILLE	H
207315			0					128	128	JOHN FEWELL	MARTINSVILLE			MORGAN	MARTINSVILLE	H
207320			0					23	18	JACK & CORA WILLIAMS	RR5	4363954.0	551462.0	MORGAN	MARTINSVILLE	H
207325			0					110	110	DA EISENBERG M/D	PO BOX 310; MARTINSVILLE, IND	4363954.0	551328.0	MORGAN	MARTINSVILLE	H
207328			0					65	62	FRANKLIN EILER	216 S MARION ST, MARTINSVILLE	4362537.0	548605.0	MORGAN	MARTINSVILLE	?
207330			0					81	78	JAMES SUTER	39 E WASHINGTON , MARTINSVILLE, IN	4364075.0	550353.0	MORGAN	MARTINSVILLE	H
207335			0					112	110	JACK COURTWRIGHT	RR4, MARTINSVILLE, IND.			MORGAN	MARTINSVILLE	H
207340			0					102	99	GEORGE BECK	RR4, MARTINSVILLE, IND.			MORGAN	MARTINSVILLE	H
207345			0					80	75	FEWELL CONSTRUCTION CO	RR3, MARTINSVILLE, IND.			MORGAN	MARTINSVILLE	H
207350			0					98		MARTINSVILLE WW #2	MARTINSVILLE	4363762.0	549073.0	MORGAN	MARTINSVILLE	PS
207353			0					40	36	AUTOPRO	930 MARTIN AVE, MARTINSVILLE, IND	4362366.0	548361.0	MORGAN	MARTINSVILLE	I
207355			0					130	125	DA EISENBURG MD	PO BO 310; MARTINSVILLE, IND.	4363954.0	551328.0	MORGAN	MARTINSVILLE	H
207360			0					110	110	DA EISENBURG MD	PO BO 310; MARTINSVILLE, IND.	4363954.0	551328.0	MORGAN	MARTINSVILLE	H
207365			0					86	81	AUSTIN (BUD) GRAY	GARFIELD AND CRAWFORD STS	4363466.0	550190.0	MORGAN	MARTINSVILLE	H
207370			0					84	82	SCHOOL DISTRICT	PO BOX 1416, MARTINSVILLE, IND.	4363430.0	550475.0	MORGAN	MARTINSVILLE	I
207375			0					115	115	SCHOOLCRAFT	3210 TEETEZ RD MARTINSVILLE, IND.	4363375.0	551330.0	MORGAN	MARTINSVILLE	H
207380			0					51	46	JOHN FEWELL	400S MAIN ST , MARTINSVILLE, IND.	4363494.0	549183.0	MORGAN	MARTINSVILLE	?
207385			0					100	40	TOWN OF MARTINSVILLE				MORGAN	MARTINSVILLE	PS
208186			0					150	145	CHARLES CASTNER	RR5, MARTINSVILLE, IND	4363729.0	552145.0	MORGAN	MARTINSVILLE	H
208191			0					53	50	JOHN FEWELL	R5 MARTINSVILLE, IND	4363424.0	551628.0	MORGAN	MARTINSVILLE	?
208201			0					85	85	GEO BECK	R5 MARTINSVILLE, IND	4363278.0	551615.0	MORGAN	MARTINSVILLE	?
208216			0					75	77	GERALD W	2870 TOWNSEND RD, MARTINSVILLE	4363411.0	551286.0	MORGAN	MARTINSVILLE	H
208221			0					46	142	RIPBERGER BLDRS				MORGAN	MARTINSVILLE	H
208321			0					95		WISER CONST	MOORESVILLE, IND.			MORGAN	MARTINSVILLE	H
208236			0					73	71	ALVA MANNERS	RR1, MARTINSVILLE, IND			MORGAN	MARTINSVILLE	H
204973			0					185	183	M/M DAN SMITH	190 E CUNNINGHAM MARTINSVILLE			MORGAN	MARTINSVILLE	H
214974			0					182	180	M/M PHIL RHYNARD	289 W SUMMER MARTINSVILLE			MORGAN	MARTINSVILLE	H
212157			0					40	36	DON PARKER C/O D.R.P.	JAMES BALDWIN DR.,MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
310529			0					100		MARTINSVILLE W.W. #1	MARTINSVILLE	4363700.0	549085.0	MORGAN	MARTINSVILLE	PS
310530			0					35		MARTINSVILLE W.W.	MARTINSVILLE	4363700.0	549085.0	MORGAN	MARTINSVILLE	PS
363610			0					51	49	PHIL MCDANIEL	) W. WASHINGTON ST.,MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
371002			0					152	150	MIKE GOODWIN	862 LINCOLN HTS., MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
371004			0					53	48	PHIL MCDANIEL	) W. WASHINGTON ST.,MARTINSVILLE, IN			MORGAN	MARTINSVILLE	H
381901			0					105	103	ALAN STAFFORD	2239 ART AVE MARTINSVILLE, IN	4363605.0	551532.0	MORGAN	MARTINSVILLE	H
385125			0					218	215	HAMILTON BROS., INC.	1840 MIDWEST BLVD			MORGAN	MARTINSVILLE	H
396537			0					40	35	DON PARKER	70 JAMES BALDWIN DR			MORGAN	MARTINSVILLE	H
396541			0					40	35	DON PARKER	70 JAMES BALDWIN DR			MORGAN	MARTINSVILLE	H
447454			0					116	114		425 Shore Ave Martinsville, IN	4363513.0	551559.0	MORGAN	MARTINSVILLE	H
Unspecified Wells																
205685										CITY OF MARTINSVILLE				MORGAN	MARTINSVILLE	T
205625								125		GRASSYFORK FISHERIES	MARTINSVILLE			MORGAN	MARTINSVILLE	?
207390								775	263	GHLAND HOTEL SANSTORIUM#2				MORGAN	MARTINSVILLE	?
207395								700		COHN-BARNARD SANITARIUM				MORGAN	MARTINSVILLE	?
205620								147		GRASSYFORK FISHERIES	MARTINSVILLE			MORGAN	MARTINSVILLE	?
205615										GRASSYFORK FISHERIES	MARTINSVILLE			MORGAN	MARTINSVILLE	?
206036								143	140	BOLINS CONSTRUCTION	MARTINSVILLE			MORGAN	MARTINSVILLE	H
208181								26	26	AMAND F. POWELL	R3. MARTINSVILLE			MORGAN	MARTINSVILLE	H
206047								220						MORGAN	MARTINSVILLE	?

H = Home
I = Industry
O = Other
PS = Public Supply
T = Test
? = Not available on logs
[1]Comments on well log indicate that as of 1977, this well is used in production cooling.

APPENDIX G

USDA Soil Map

United States Department of Agriculture

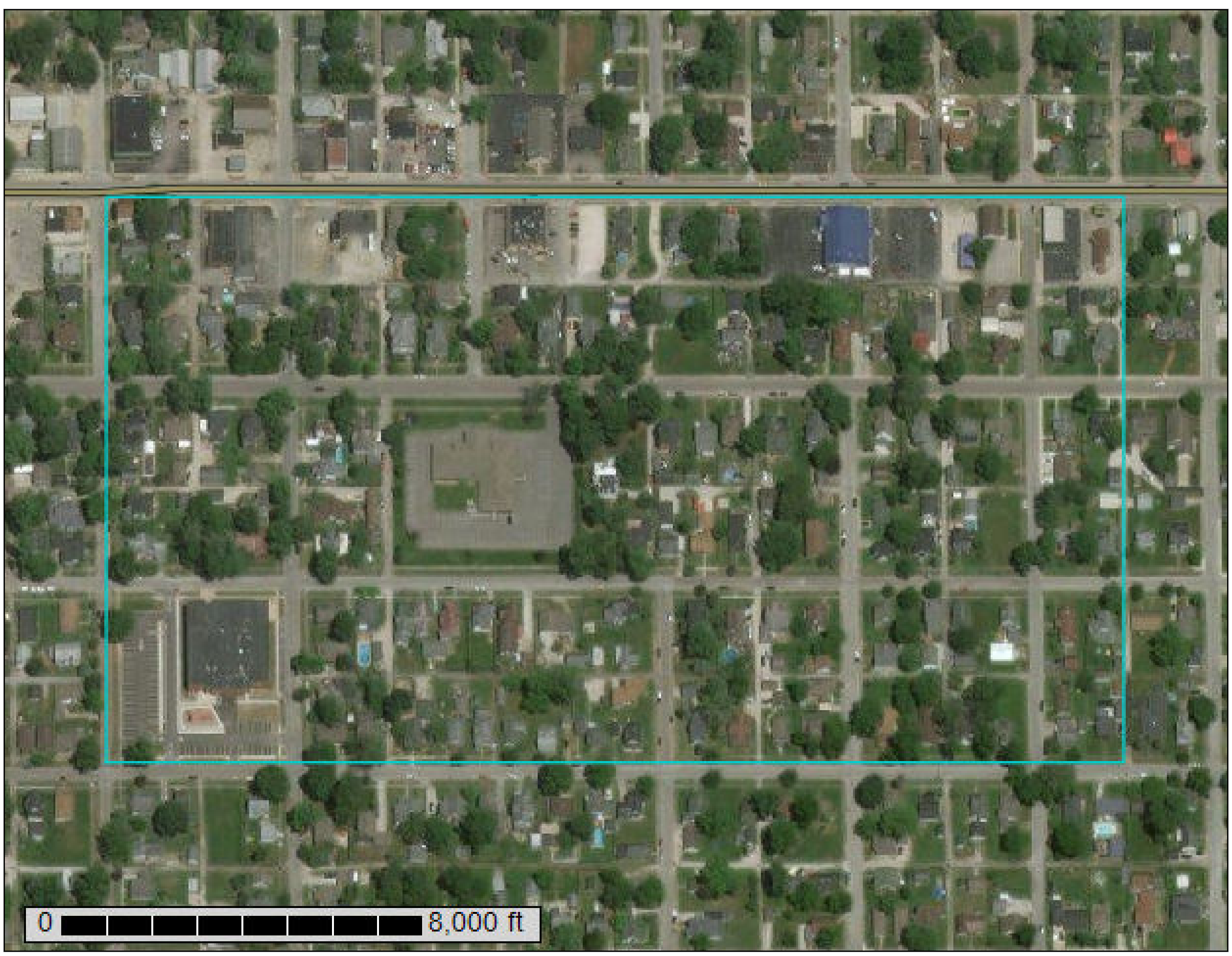
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Morgan County, Indiana



November 3, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,090 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 45, 90, 180, 270

Feet: 0, 150, 300, 600, 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Morgan County, Indiana
Survey Area Data: Version 24, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 24, 2014—Mar 20, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MeA	Martinsville loam, 0 to 2 percent slopes	31.7	73.0%
PrB	Princeton fine sandy loam, 2 to 6 percent slopes	11.7	27.0%
Totals for Area of Interest		**43.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Morgan County, Indiana

MeA—Martinsville loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5gv9
Elevation: 350 to 1,250 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 49 to 56 degrees F
Frost-free period: 170 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Martinsville and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Martinsville

Setting

Landform: Outwash plains, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy outwash

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 46 inches: clay loam
H3 - 46 to 50 inches: sandy loam
H4 - 50 to 60 inches: stratified sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 45 percent
Available water storage in profile: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

PrB—Princeton fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 5gvy
Elevation: 350 to 1,250 feet
Mean annual precipitation: 36 to 46 inches
Mean annual air temperature: 49 to 56 degrees F
Frost-free period: 170 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Princeton and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Princeton

Setting

Landform: Dunes
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 40 inches: fine sandy loam
H3 - 40 to 53 inches: stratified loamy fine sand to fine sandy loam
H4 - 53 to 60 inches: stratified fine sand to silt

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

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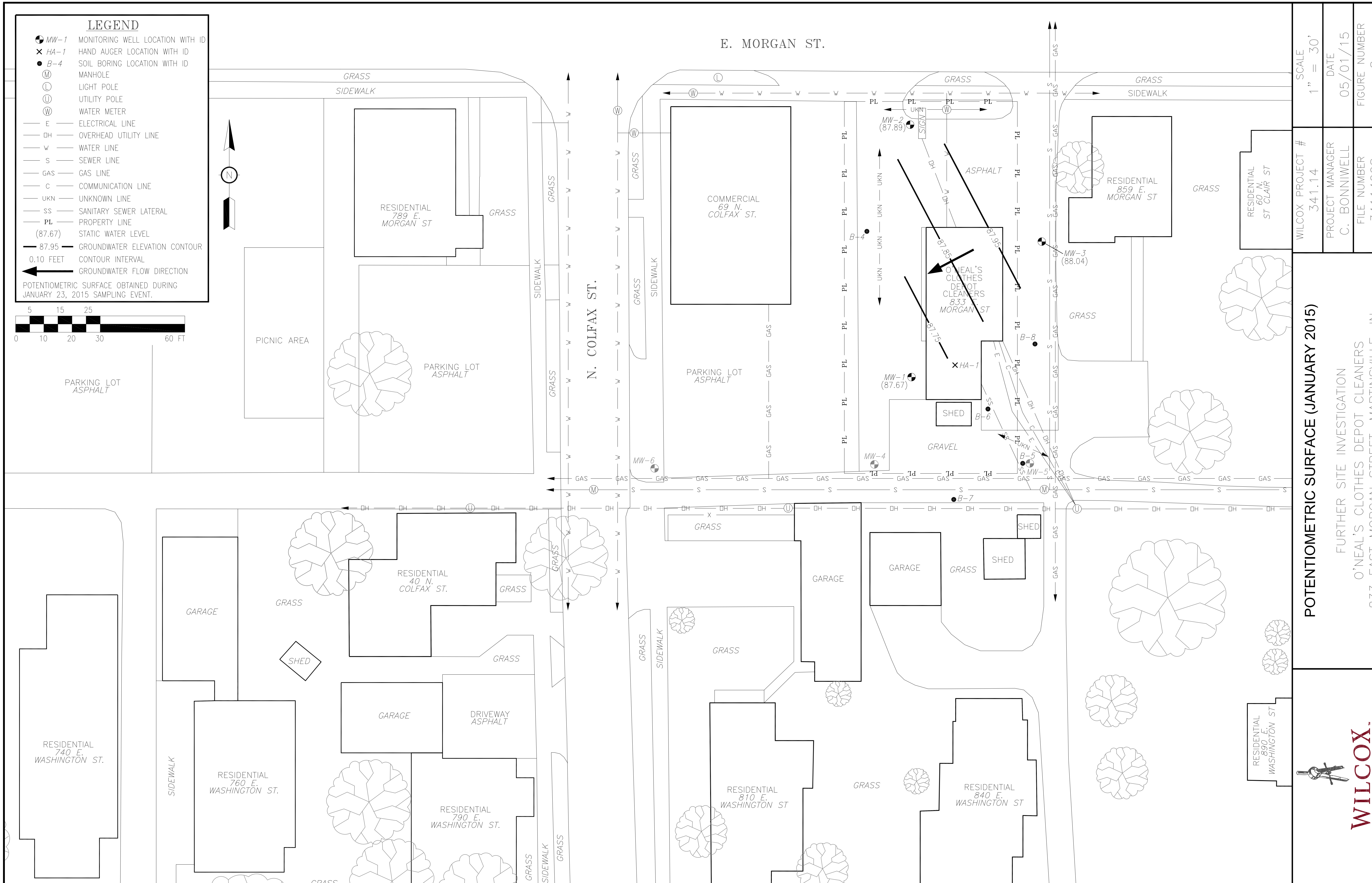
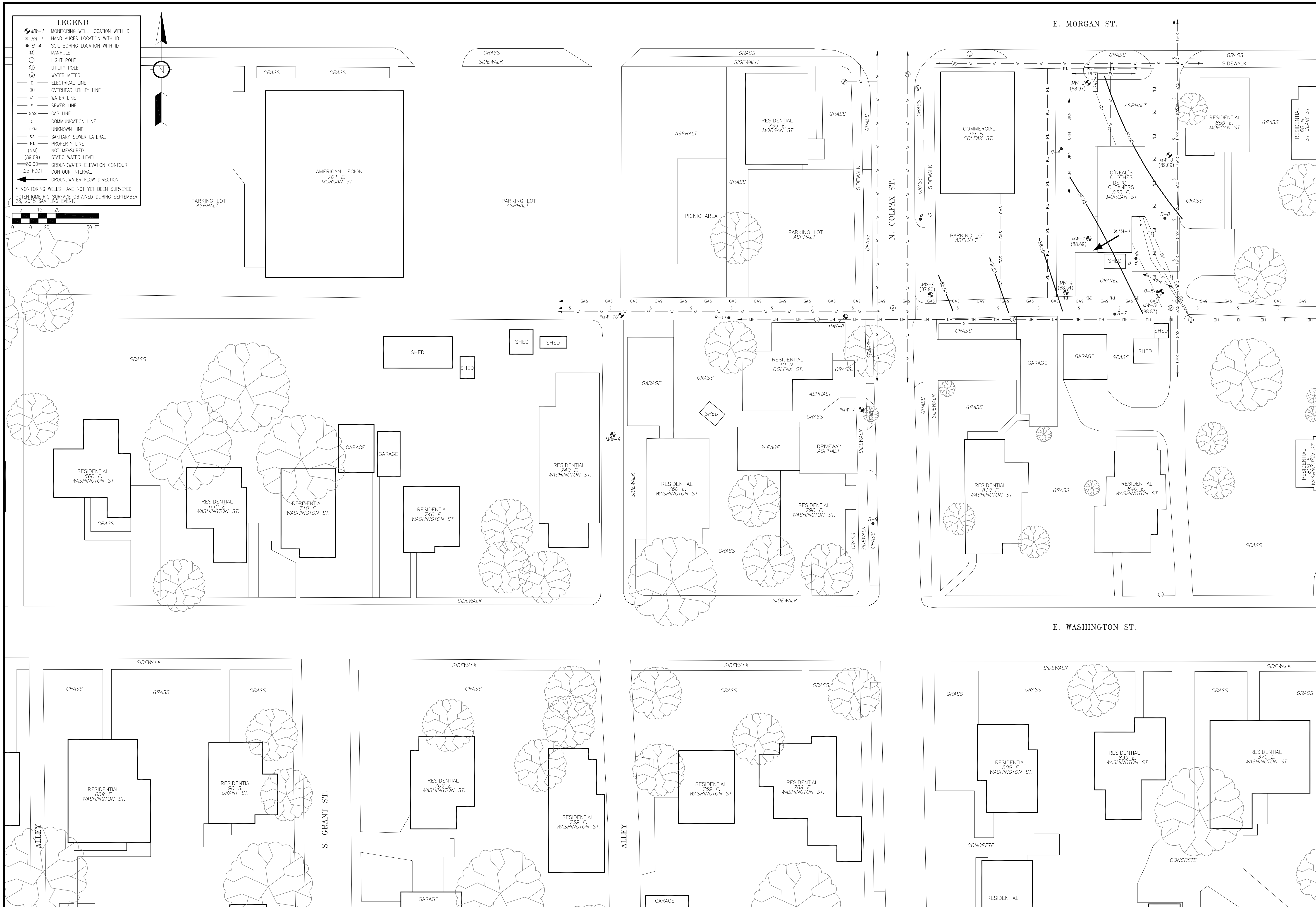
APPENDIX H

Historical Potentiometric Surface Maps



LEGEND
MW-1 MONITORING WELL LOCATION WITH ID
HA-1 HAND AUGER LOCATION WITH ID
B-4 SOIL BORING LOCATION WITH ID
MANHOLE
LIGHT POLE
UTILITY POLE
WATER METER
E ELECTRICAL LINE
OH OVERHEAD UTILITY LINE
W WATER LINE
S SEWER LINE
GAS GAS LINE
C COMMUNICATION LINE
UKN UNKNOWN LINE
SS SANITARY SEWER LATERAL
PL PROPERTY LINE
(87.67) STATIC WATER LEVEL
87.95 GROUNDWATER ELEVATION CONTOUR
0.10 FEET CONTOUR INTERVAL
GROUNDWATER FLOW DIRECTION
POTENTIOMETRIC SURFACE OBTAINED DURING JANUARY 23, 2015 SAMPLING EVENT.
0 10 20 30 60 FT
E. MORGAN ST.
N. COLFAX ST.
RESIDENTIAL 789 E. MORGAN ST
COMMERCIAL 69 N. COLFAX ST.
O'NEAL'S CLOTHES DEPOT CLEANERS 833 E. MORGAN ST
RESIDENTIAL 859 E. MORGAN ST
RESIDENTIAL 60 N. ST CLAIR ST
PICNIC AREA
PARKING LOT ASPHALT
MW-2 (87.89)
MW-3 (88.04)
MW-1 (87.67)
MW-4
MW-5
MW-6
B-4
B-5
B-6
B-7
B-8
HA-1
87.95
87.85
87.75
SHED
GRAVEL
ASPHALT
SIGN
GARAGE
RESIDENTIAL 40 N. COLFAX ST.
RESIDENTIAL 740 E. WASHINGTON ST.
RESIDENTIAL 760 E. WASHINGTON ST.
RESIDENTIAL 790 E. WASHINGTON ST.
DRIVEWAY ASPHALT
RESIDENTIAL 810 E. WASHINGTON ST
RESIDENTIAL 840 E. WASHINGTON ST
RESIDENTIAL 890 E. WASHINGTON ST
GRASS
SIDEWALK
SCALE 1" = 30'
DATE 05/01/15
FIGURE NUMBER 8
WILCOX PROJECT # 341.14
PROJECT MANAGER C. BONNIWELL
FILE NUMBER 34114008
POTENTIOMETRIC SURFACE (JANUARY 2015)
FURTHER SITE INVESTIGATION
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN
WILCOX ENVIRONMENTAL ENGINEERING



SCALE 1" = 50'

DATE 10/02/15

FIGURE NUMBER 3

WILCOX PROJECT # 341.14

PROJECT MANAGER C. BONNIWELL

FILE NUMBER 34114003

POTENTIOMETRIC SURFACE (09-28-2015)

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE (02/04-05/16)

FURTHER SITE INVESTIGATION
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

SCALE 1" = 80'	DATE 02/09/16	FIGURE NO. 3
WILCOX PROJECT # 341.14	PROJECT MANAGER C. BONNIWELL	FILE NO. 34114003

WILCOX ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE MAP (NOVEMBER 2016)

FOURTH QUARTER 2016

O'NEAL'S CLOTHES DEPOT CLEANERS

833 EAST MORGAN STREET, MARTINSVILLE, IN

SCALE 1" = 80'	WILCOX PROJECT # 341.14
DATE 02/10/17	PROJECT MANAGER J. KINMAN
FIGURE NO. 2	FILE NO. 34114002

WILCOX ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE (02/01/17)

FIRST QUARTER 2017
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT #
341.14

PROJECT MANAGER
J. KINMAN

FILE NO.
3411402

SCALE
1" = 80'

DATE
03/22/17

FIGURE NO.
2

WILCOX
ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE (05/02/17)

SECOND QUARTER 2017

O'NEAL'S CLOTHES DEPOT CLEANERS

833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT # 341.14	SCALE 1" = 80'	PROJECT MANAGER J. KINMAN	DATE 05/26/17
FILE NO. 34114002	FIGURE NO. 2		

WILCOX ENVIRONMENTAL ENGINEERING

WILCOX PROJECT # 341.14

PROJECT MANAGER J. KINMAN

SCALE 1" = 80'

DATE 10/10/17

FILE NO. 3411400Z

FIGURE NO. 2

POTENTIOMETRIC SURFACE (09/18/17)

THIRD QUARTER 2017

O'NEAL'S CLOTHES DEPOT CLEANERS

833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE (12/05/17)

FOURTH QUARTER 2017
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

SCALE 1" = 80'	DATE 01/08/18	FIGURE NO. 2
WILCOX PROJECT # 341.14	PROJECT MANAGER J. KINMAN	FILE NO. 34114002

WILCOX ENVIRONMENTAL ENGINEERING

WILCOX PROJECT #
341.14

PROJECT MANAGER
J. KINMAN

FILE NO.
3411400 2

SCALE
1" = 80'

DATE
04/26/18

FIGURE NO.
2A

POTENTIOMETRIC SURFACE (03/19/18)

FIRST QUARTER 2018

O'NEAL'S CLOTHES DEPOT CLEANERS

833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING

WILCOX PROJECT # 341.14

PROJECT MANAGER J. KINMAN

SCALE 1" = 80'

DATE 06/29/18

FILE NO. 34114002

FIGURE NO. 2B

POTENTIOMETRIC SURFACE (05/29/18)

SECOND QUARTER 2018

O'NEAL'S CLOTHES DEPOT CLEANERS

833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE (08/27/18)
THIRD QUARTER 2018
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN
WILCOX PROJECT #
341.14
PROJECT MANAGER
J. KINMAN
SCALE
1" = 80'
DATE
09/12/18
FILE NO.
3411406
FIGURE NO.
6
WILCOX
ENVIRONMENTAL ENGINEERING
LEGEND
E. MORGAN ST.
E. WASHINGTON ST.
JACKSON ST.
E. COLUMBUS ST.

SCALE
1" = 80'

DATE
12/17/18

FIGURE NO.
2B

WILCOX PROJECT #
341.14

PROJECT MANAGER
J. KINMAN

FILE NO.
34114006

POTENTIOMETRIC SURFACE (11/26/18)
FOURTH QUARTER 2018

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX™
ENVIRONMENTAL ENGINEERING

WILCOX PROJECT # 341.14

PROJECT MANAGER J. KINMAN

FILE NO. 34114006

SCALE 1" = 80'

DATE 3/15/19

FIGURE NO. 2A

POTENTIOMETRIC SURFACE (2/19/19)

FIRST QUARTER 2019

O'NEAL'S CLOTHES DEPOT CLEANERS

833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX ENVIRONMENTAL ENGINEERING

POTENTIOMETRIC SURFACE (5/20/19)

SECOND QUARTER 2019
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT # 341.14	SCALE 1" = 80'
PROJECT MANAGER J. KINMAN	DATE 6/17/19
FILE NO. 34114006	FIGURE NO. 2B

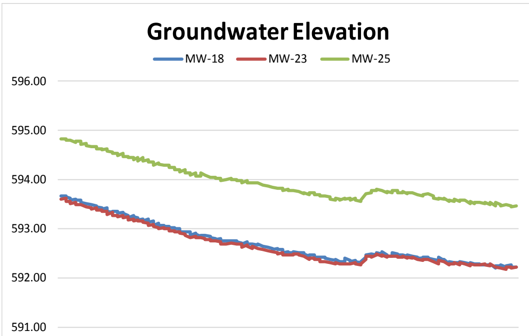
WILCOX
ENVIRONMENTAL ENGINEERING

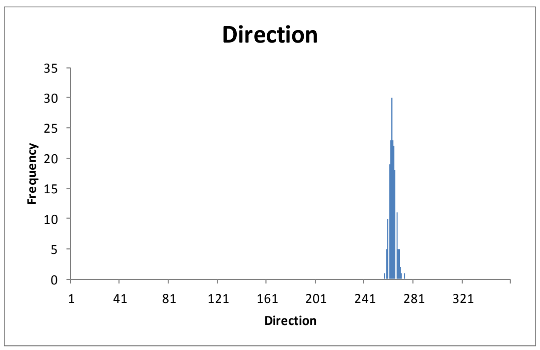
APPENDIX I

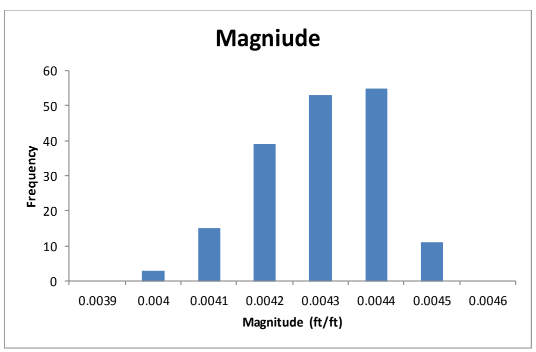
Groundwater Flow Variability Evaluation

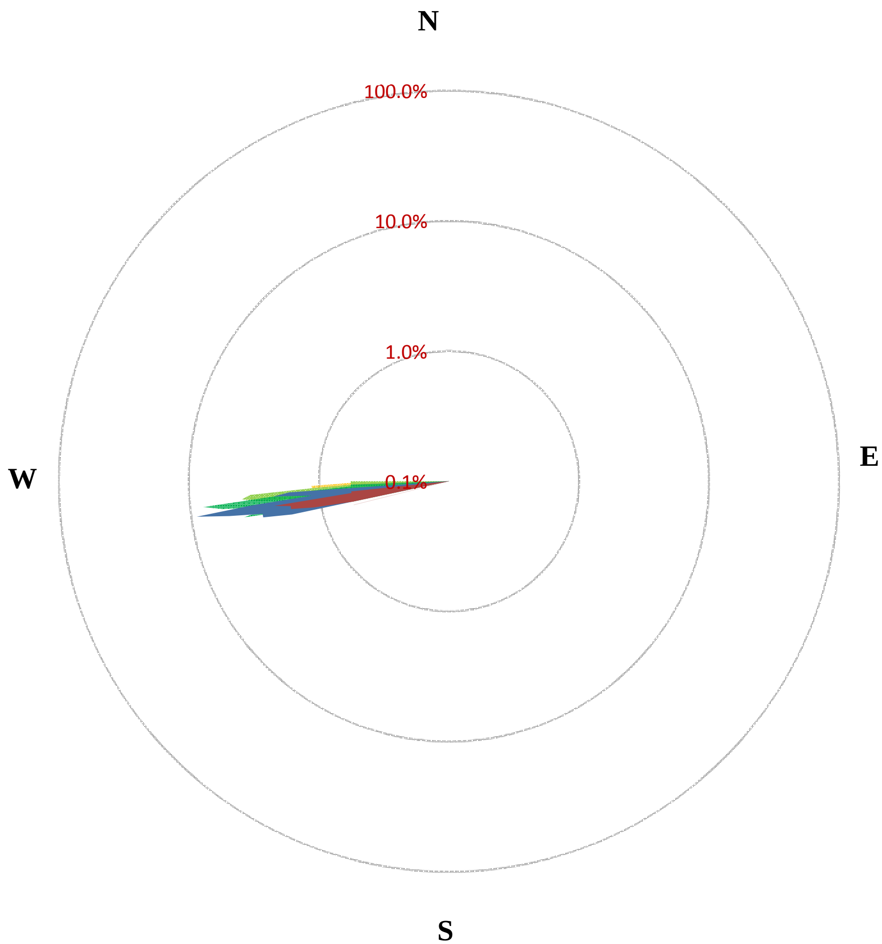
Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

MW-18, MW-23, MW-25









Data Collected: September 8, 2017through December 5, 2017

Elevation	
Average	593.11
Max	594.83
Min	592.17
Count	528

Direction	
Average	264
Max	273
Min	257
Count	176

Magnitude (ft/ft)	
Average	0.00425
Max	0.00449
Min	0.00396
Count	176

Hydraulic Gradient (ft/ft)

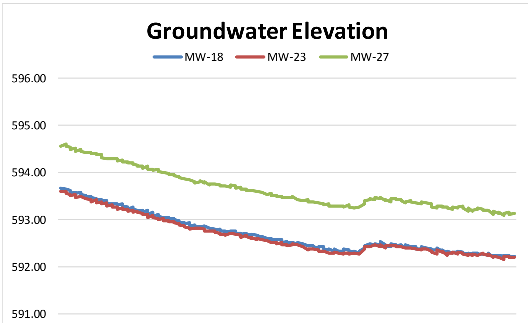
- 0.0039-0.004
- 0.004-0.0041
- 0.0041-0.0042
- 0.0042-0.0043
- 0.0043-0.0044
- 0.0044-0.0045

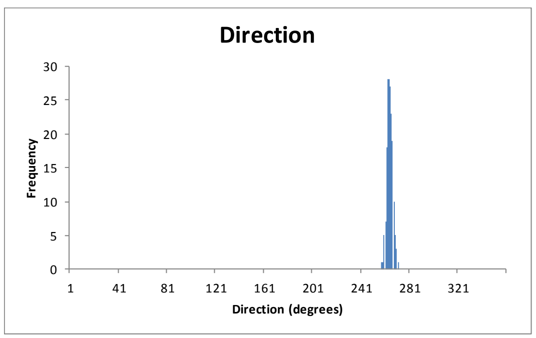
Groundwater Flow Direction and Magnitude

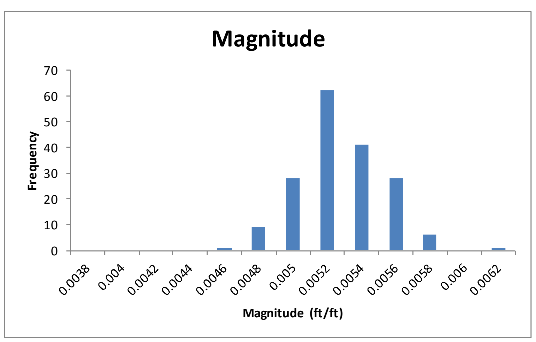
Former O'Neal's Clothes Depot Cleaners

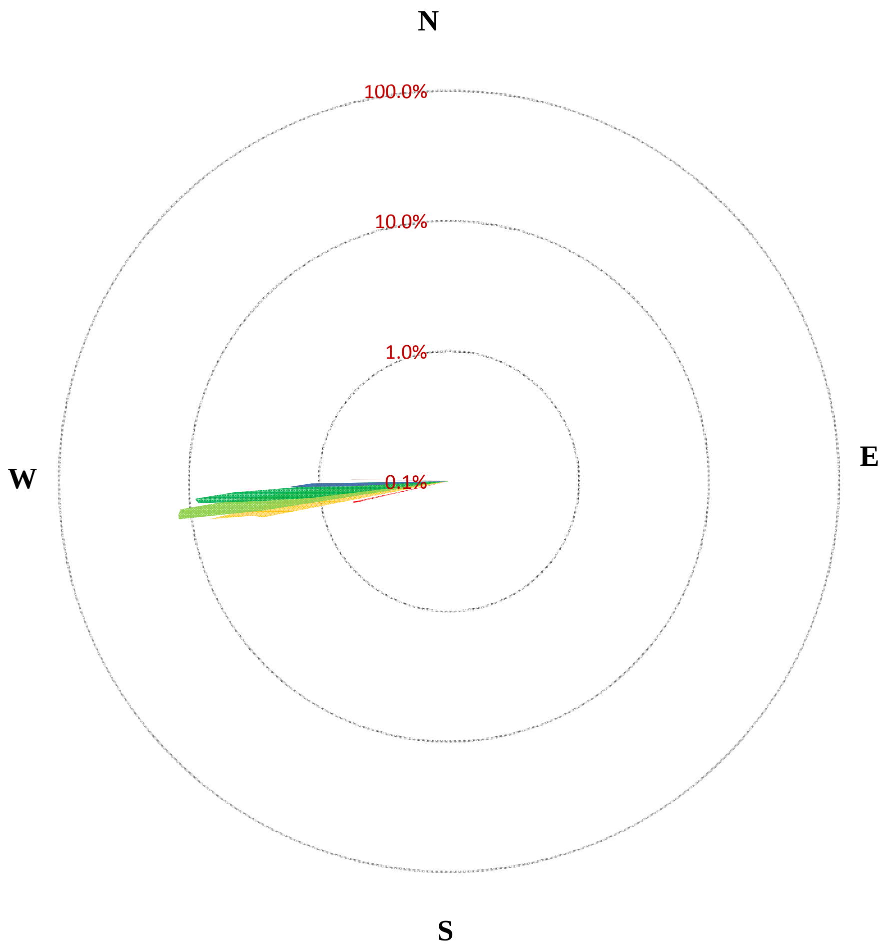
Martinsville, Indiana

MW-18, MW-23, MW-27









Data Collected: September 8, 2017through December 5, 2017

Elevation	
Average	593.01
Max	594.60
Min	592.17
Count	528

Direction	
Average	265
Max	272
Min	258
Count	176

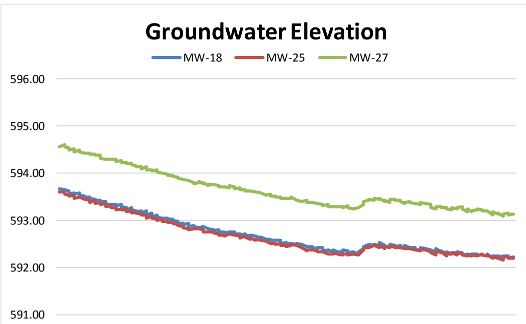
Magnitude (ft/ft)	
Average	0.00517
Max	0.00602
Min	0.00449
Count	176

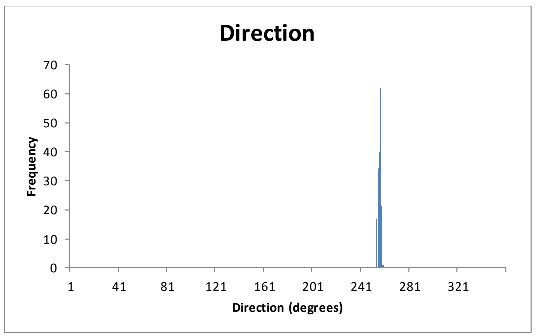
Hydraulic Gradient (ft/ft)

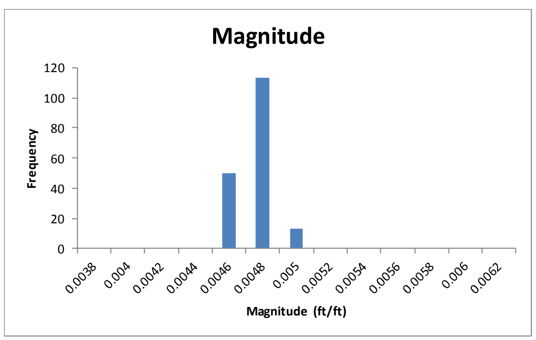
- 0.0044-0.0047
- 0.0047-0.005
- 0.005-0.0053
- 0.0053-0.0056
- 0.0056-0.0059
- 0.0059-0.0062

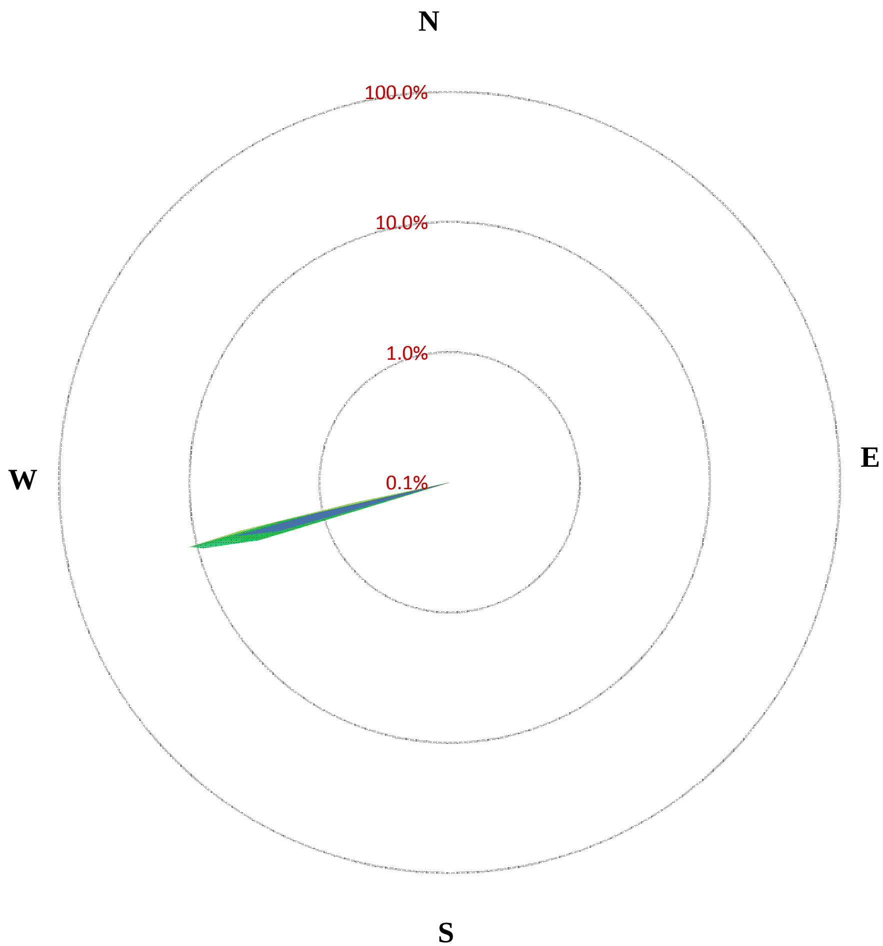
Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

MW-18, MW-25, MW-27









Data Collected: September 8, 2017through December 5, 2017

Elevation	
Average	593.01
Max	594.60
Min	592.17
Count	528

Direction	
Average	256
Max	260
Min	254
Count	176

Magnitude (ft/ft)	
Average	0.00465
Max	0.00488
Min	0.00441
Count	176

Hydraulic Gradient (ft/ft)

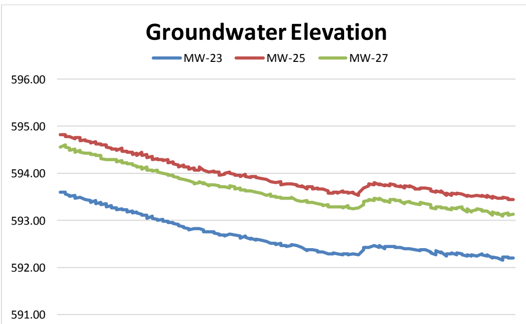
- 0.00441-0.0045
- 0.0045-0.00459
- 0.00459-0.00468
- 0.00468-0.00477
- 0.00477-0.00486
- 0.00486-0.00495

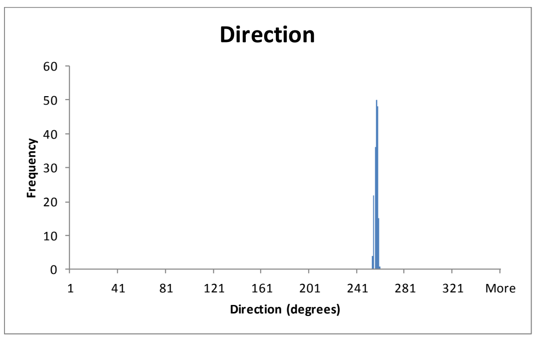
Groundwater Flow Direction and Magnitude

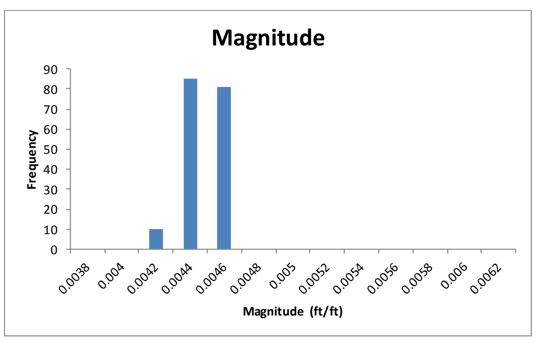
Former O'Neal's Clothes Depot Cleaners

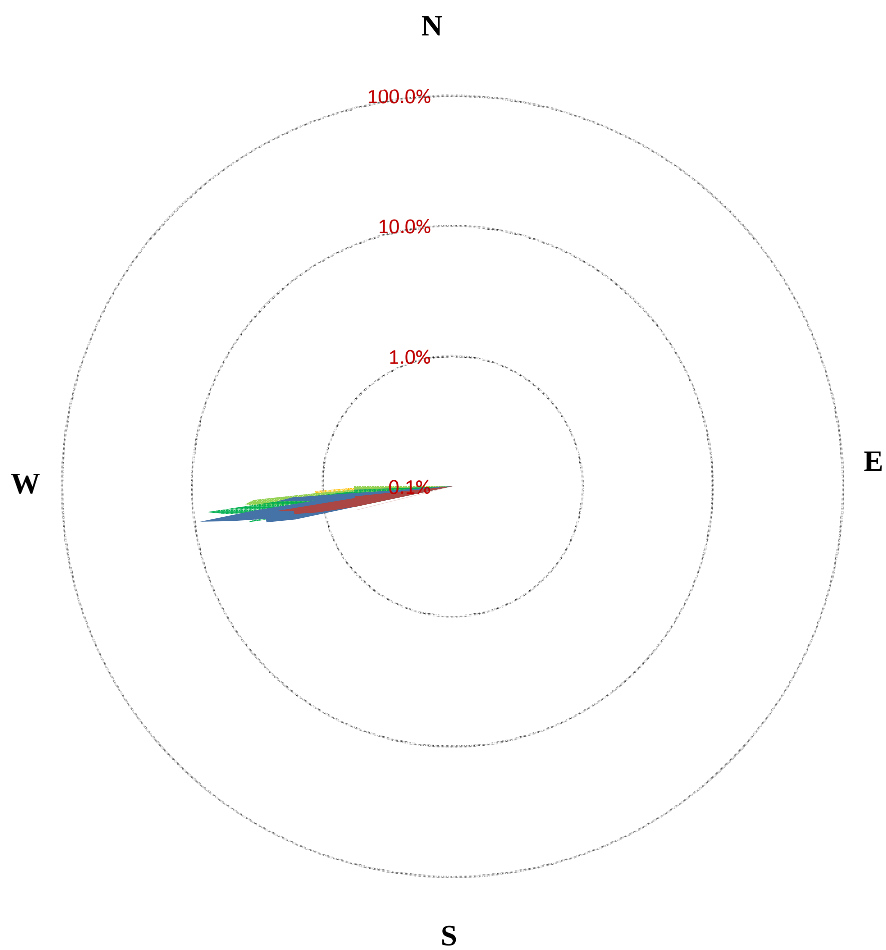
Martinsville, Indiana

MW-23, MW-25, MW-27









Data Collected: September 8, 2017through December 5, 2017

Elevation	
Average	593.42
Max	594.83
Min	592.17
Count	528

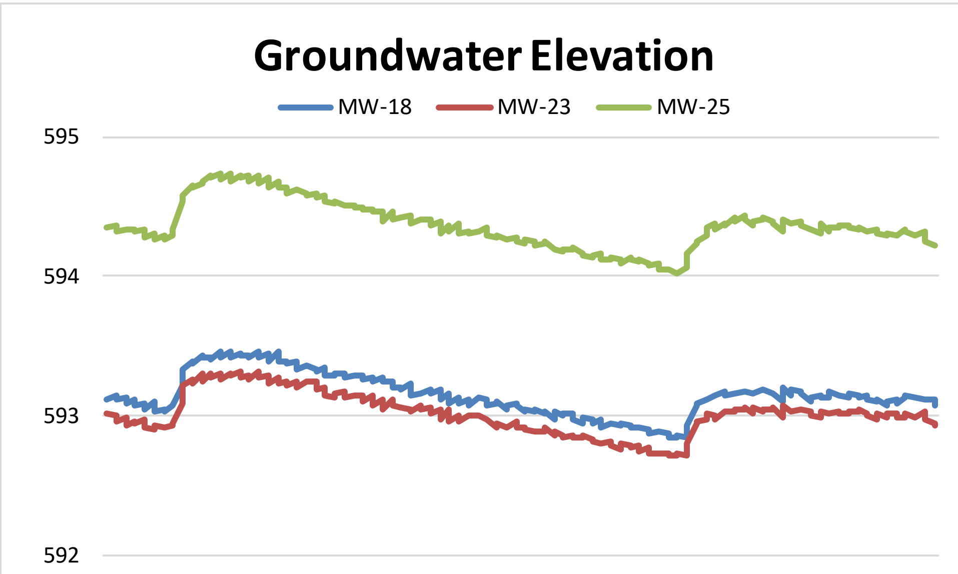
Direction	
Average	257
Max	260
Min	254
Count	176

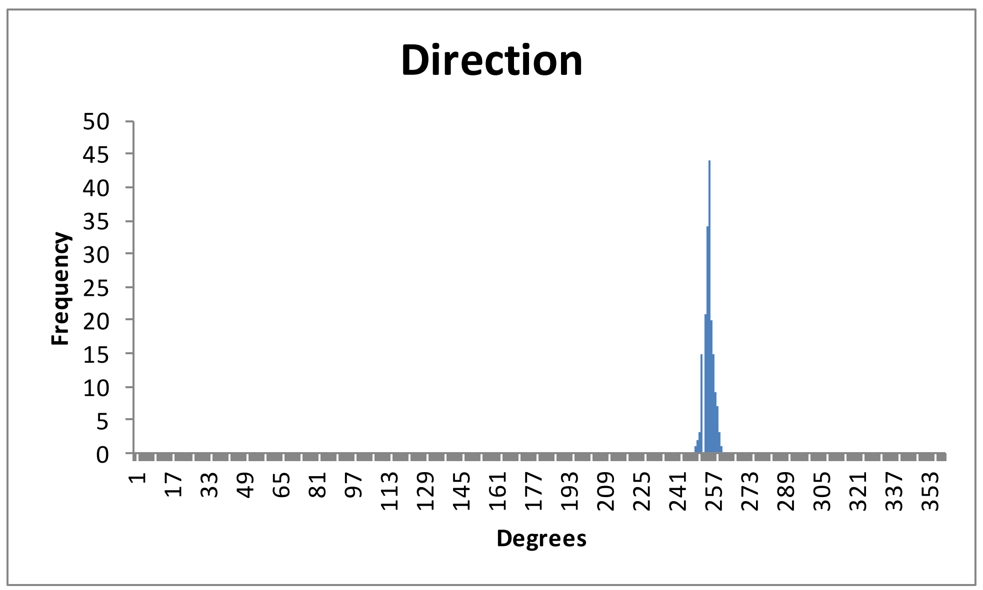
Magnitude (ft/ft)	
Average	0.00437
Max	0.00458
Min	0.00415
Count	176

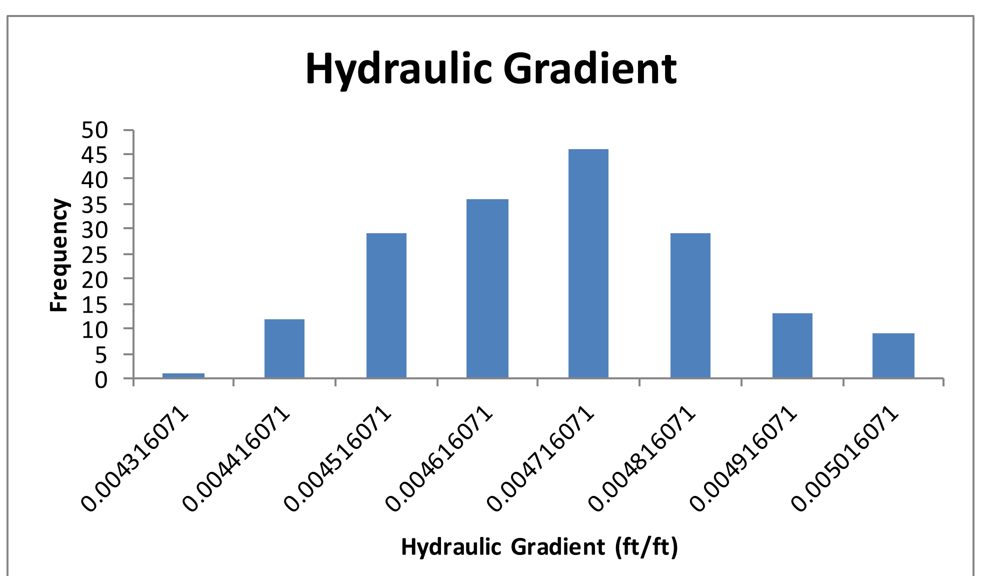
Hydraulic Gradient (ft/ft)

- 0.0039-0.004
- 0.004-0.0041
- 0.0041-0.0042
- 0.0042-0.0043
- 0.0043-0.0044
- 0.0044-0.0045

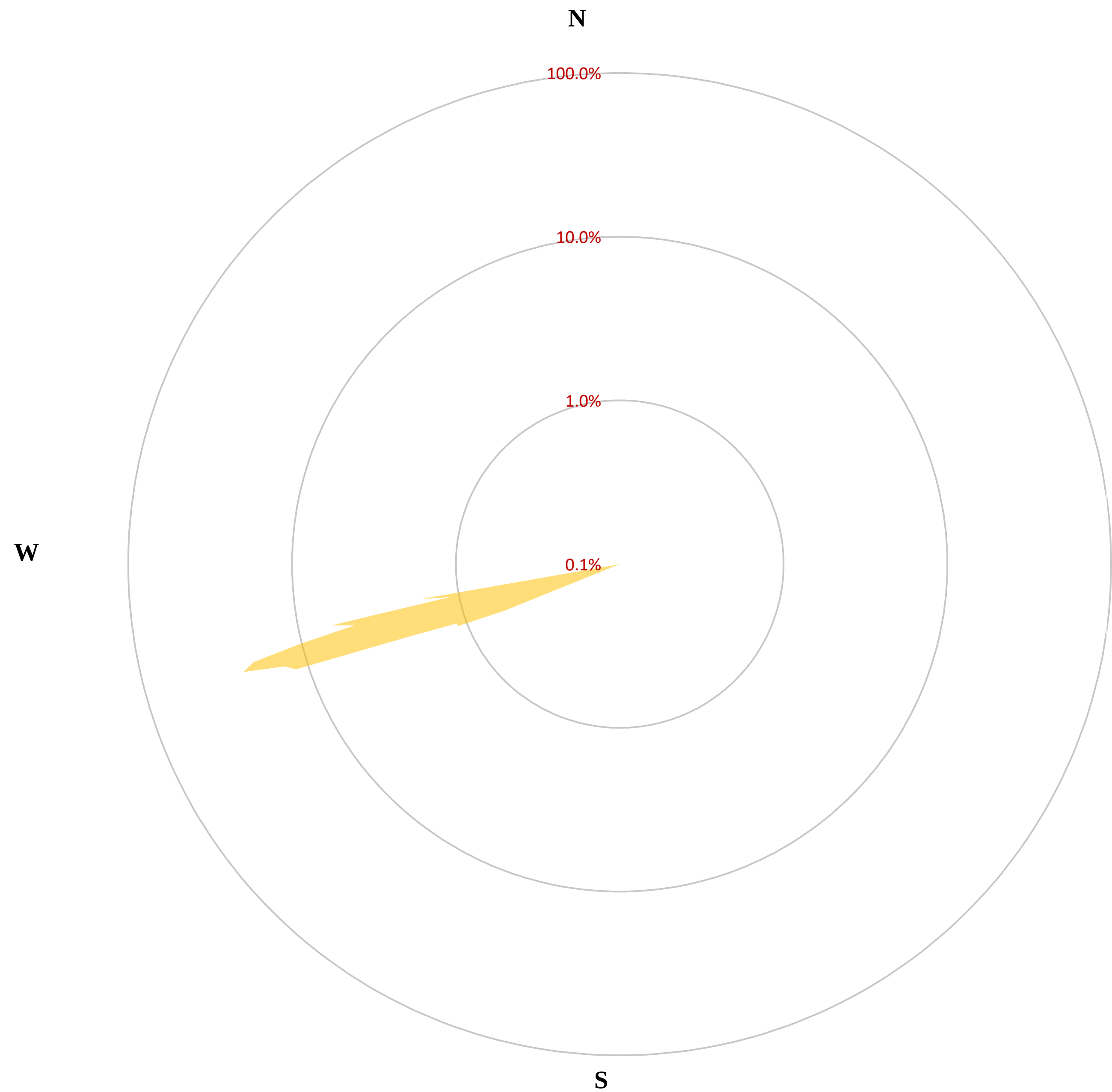
Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana







MW-18, MW-23, MW-25

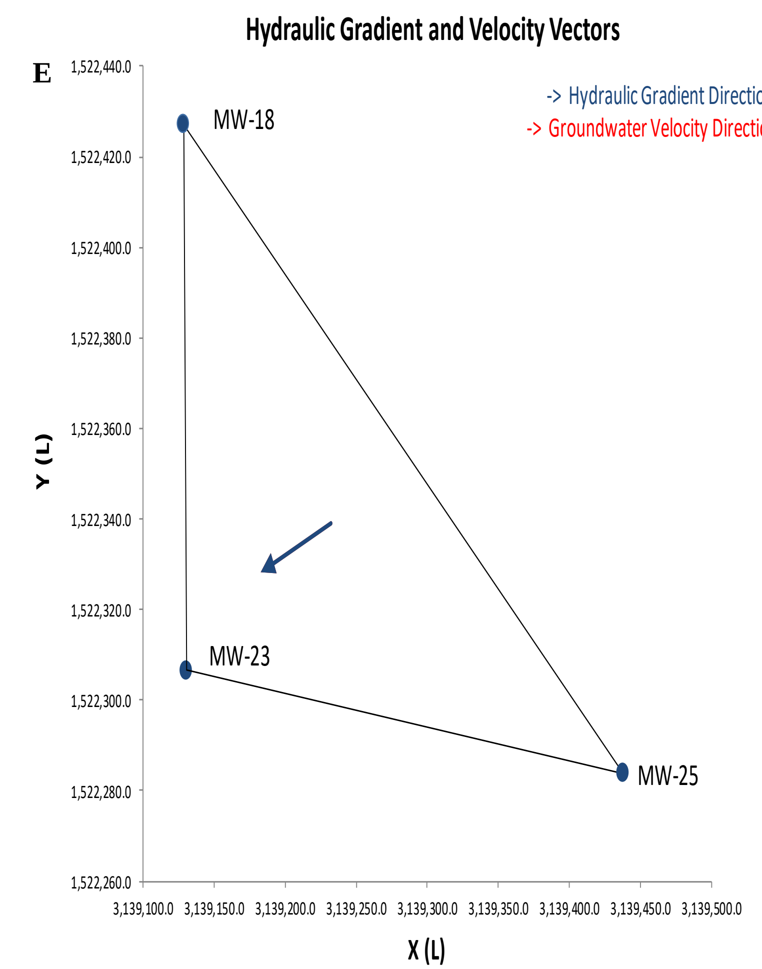


Data Collected: September 1, 2018 through November 27, 2018

Hydraulic Gradient	
Min	0.004316
Max	0.004975
Average	0.004638
Count	175

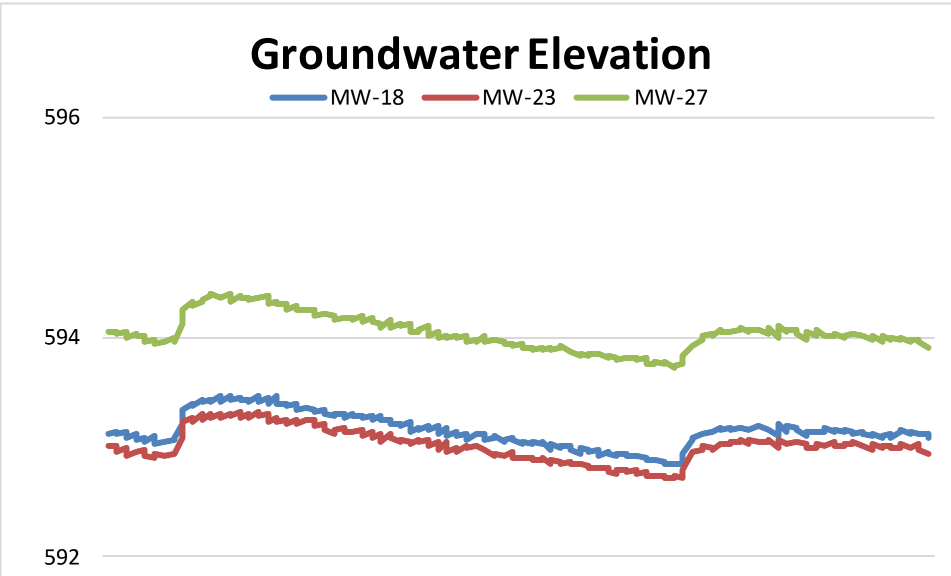
Direction	
Min	249
Max	261
Average	255
Count	175

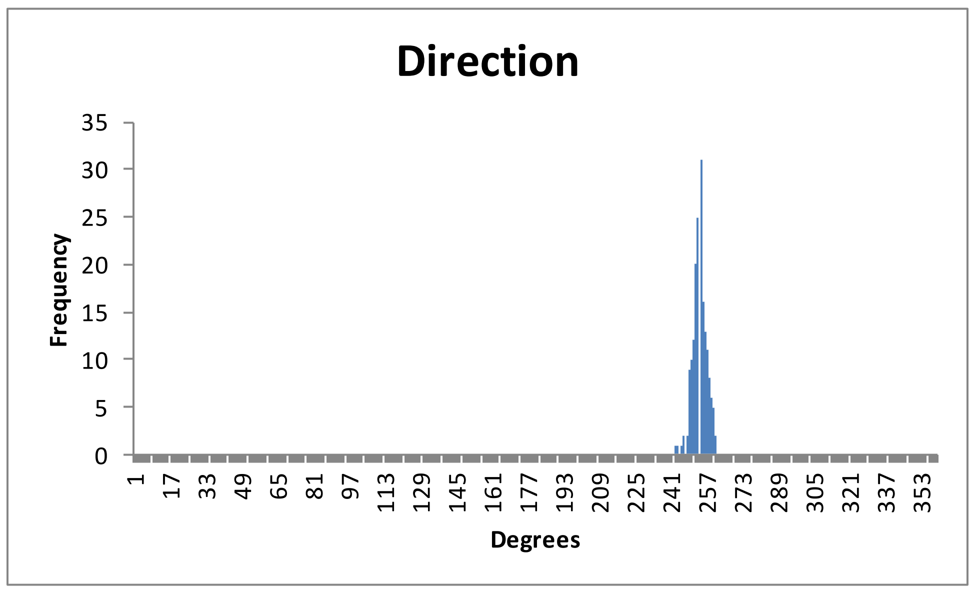
Hydraulic Gradient (ft/ft)
0.004316-0.005316

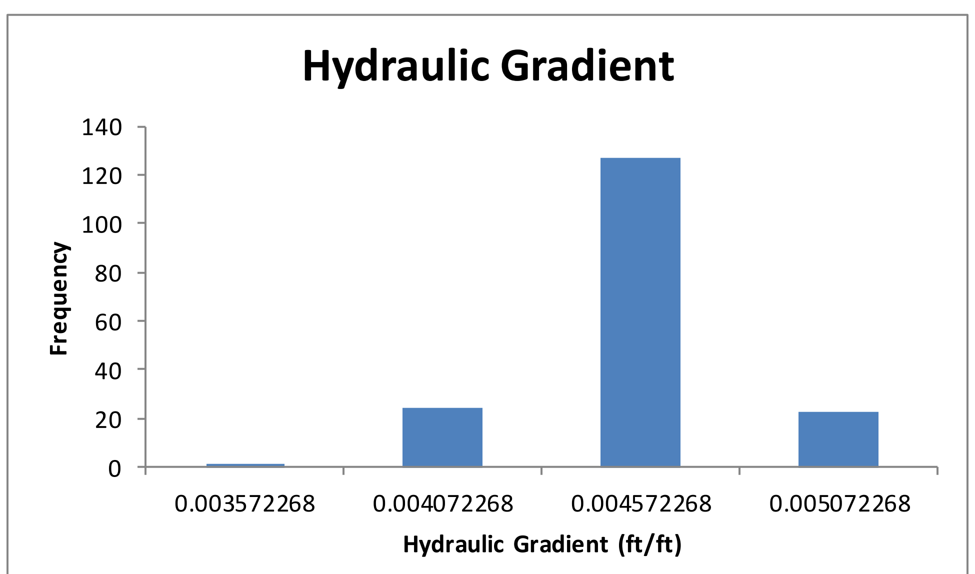


Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

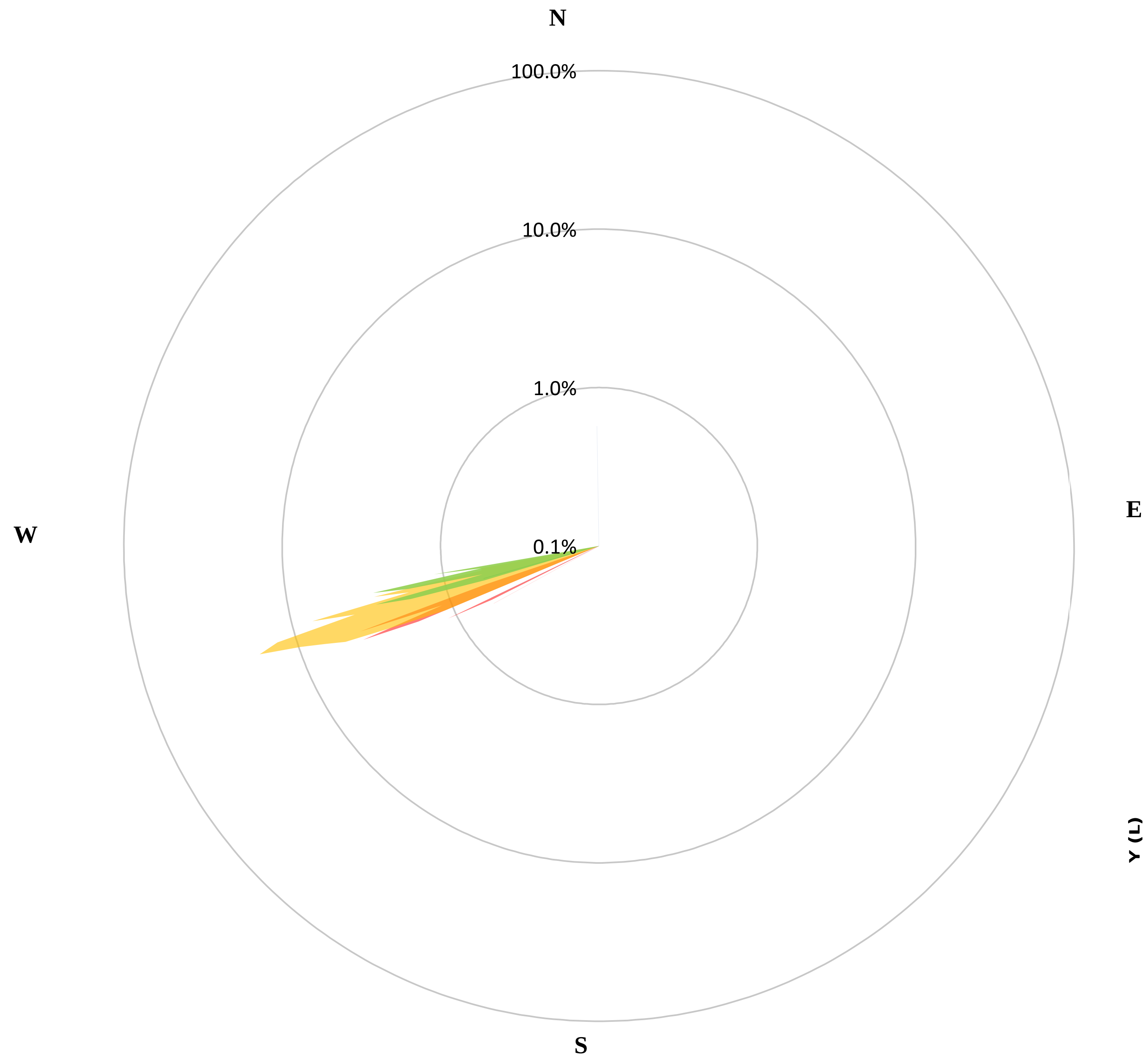
WILCOX







MW-18, MW-23, MW-27

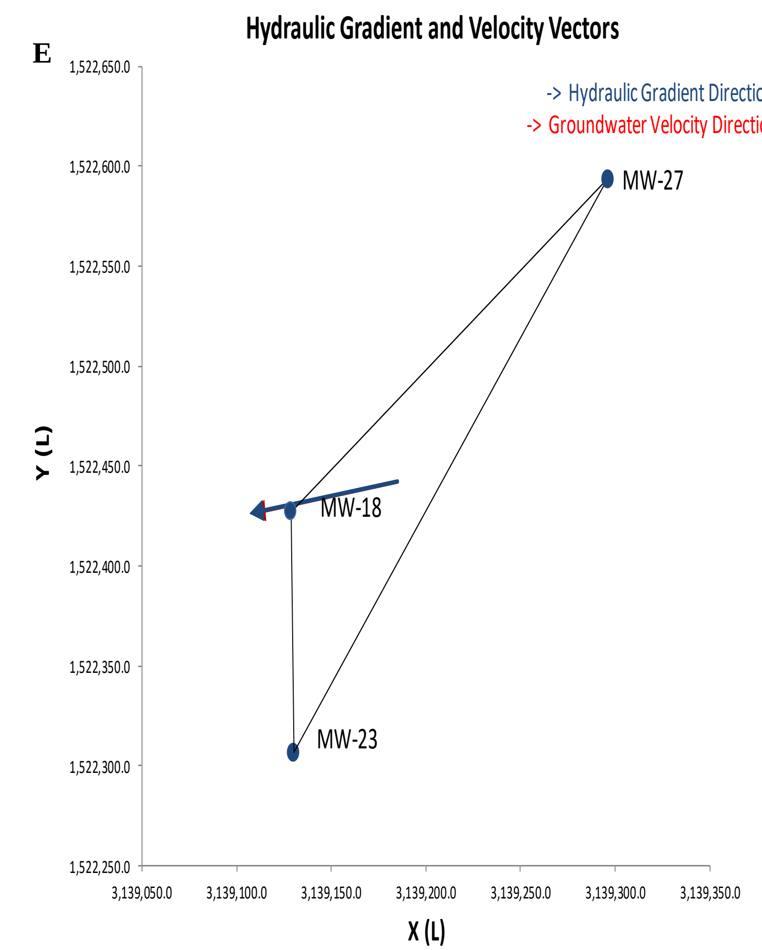


Data Collected: September 1, 2018 through November 27, 2018

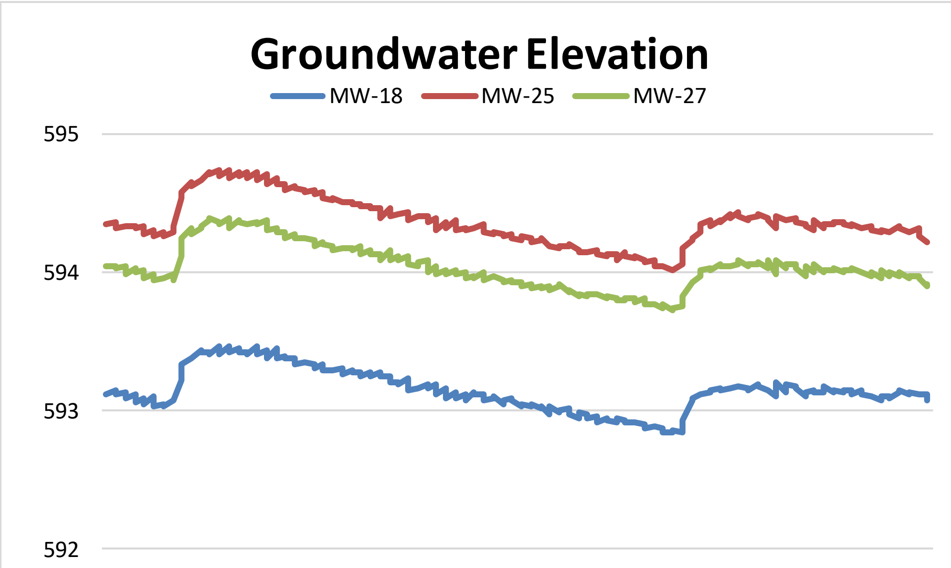
Direction	
Min	243
Max	262
Average	254
Count	175

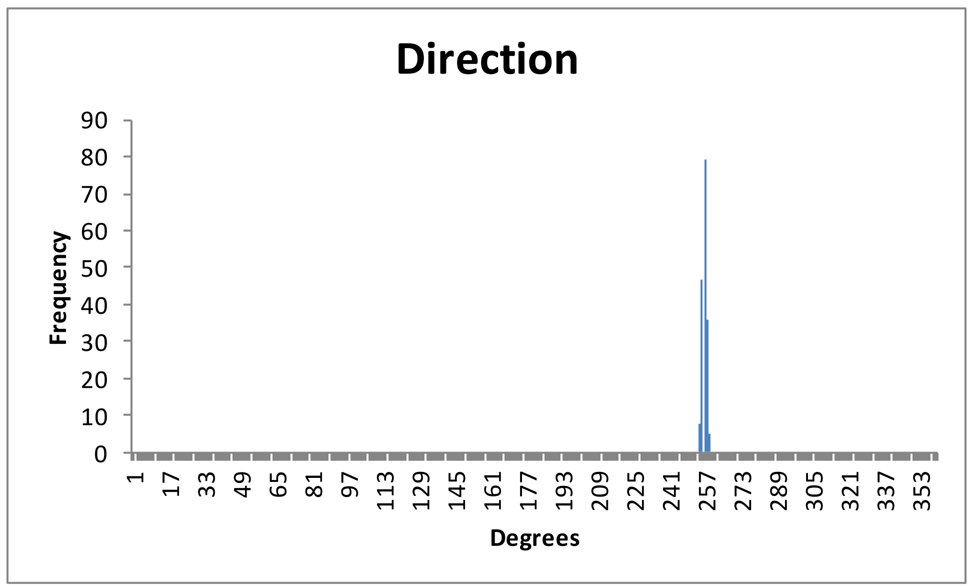
Hydraulic Gradient	
Min	0.003572
Max	0.004848
Average	0.004316
Count	175

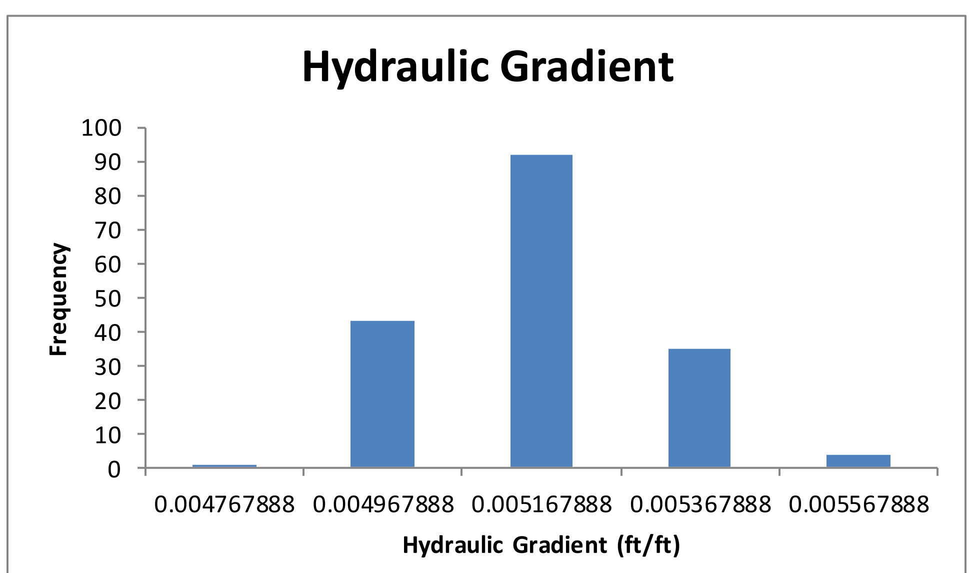
Hydraulic Gradient (ft/ft)
- <0.003572 or (blank)
- 0.003572-0.004072
- 0.004072-0.004572
- 0.004572-0.005072
- >0.005072

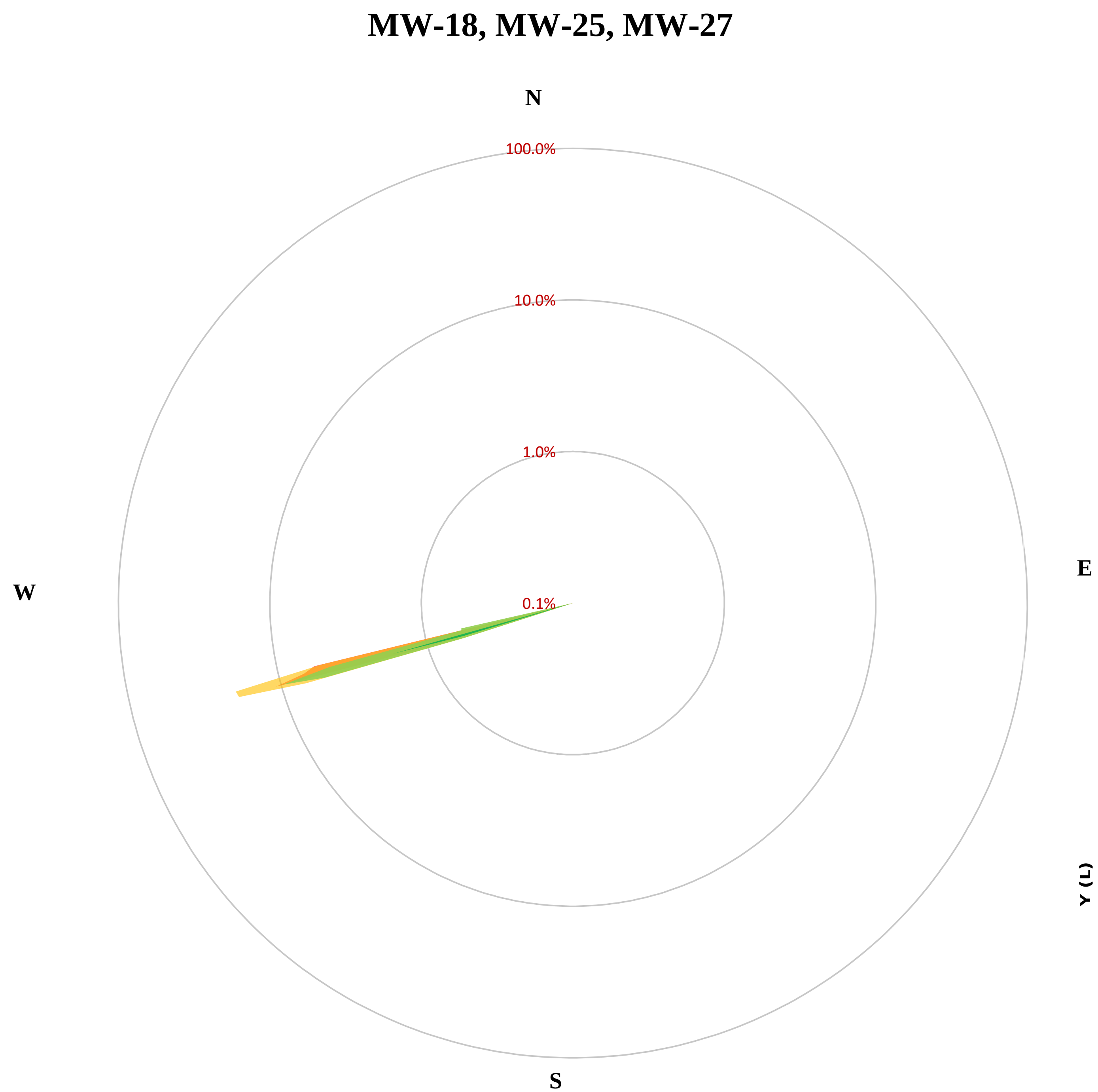


Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana









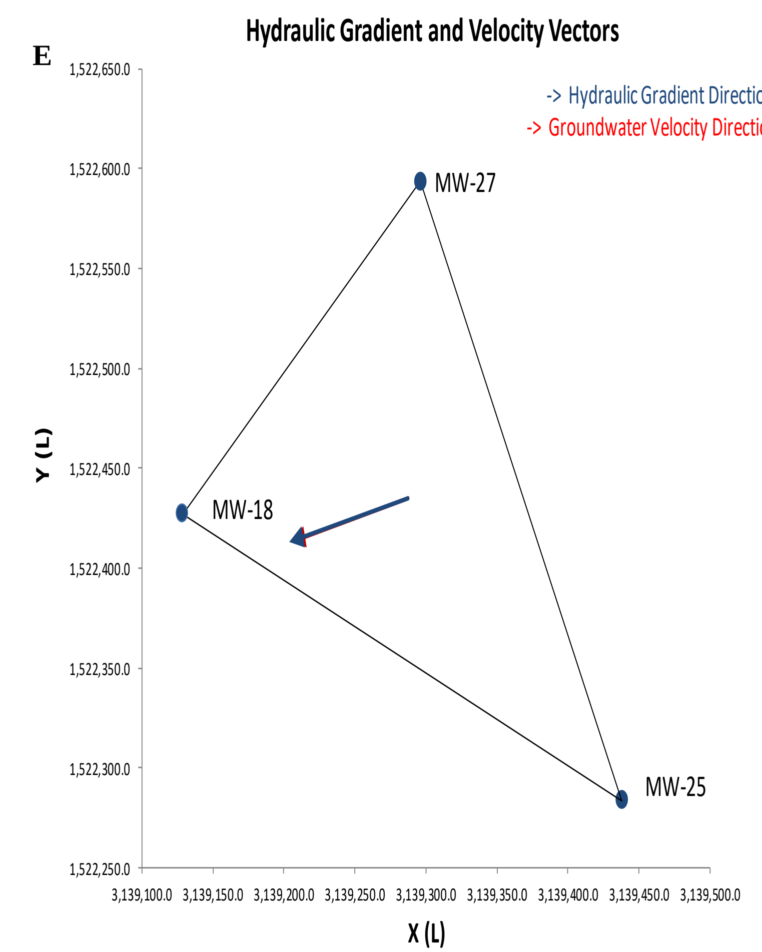
Data Collected: September 1, 2018 through November 27, 2018

Hydraulic Gradient	
Min	0.004768
Max	0.005473
Average	0.005073
Count	175

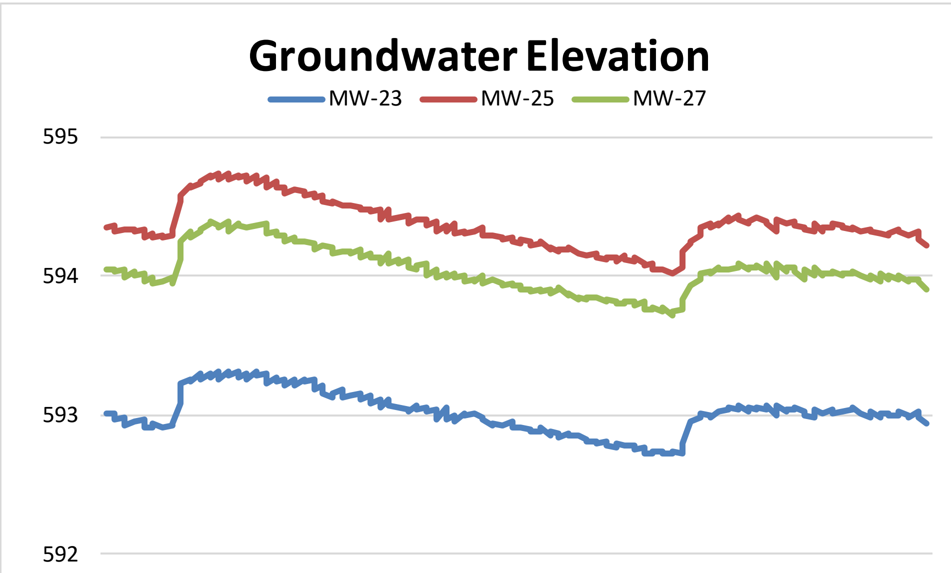
Direction	
Min	254
Max	259
Average	256
Count	175

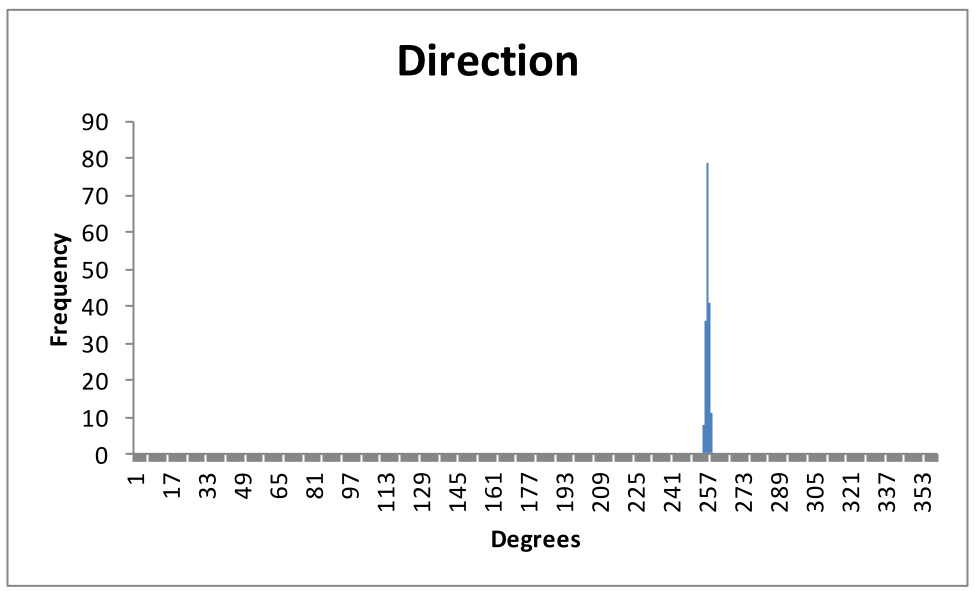
Hydraulic Gradient (ft/ft)

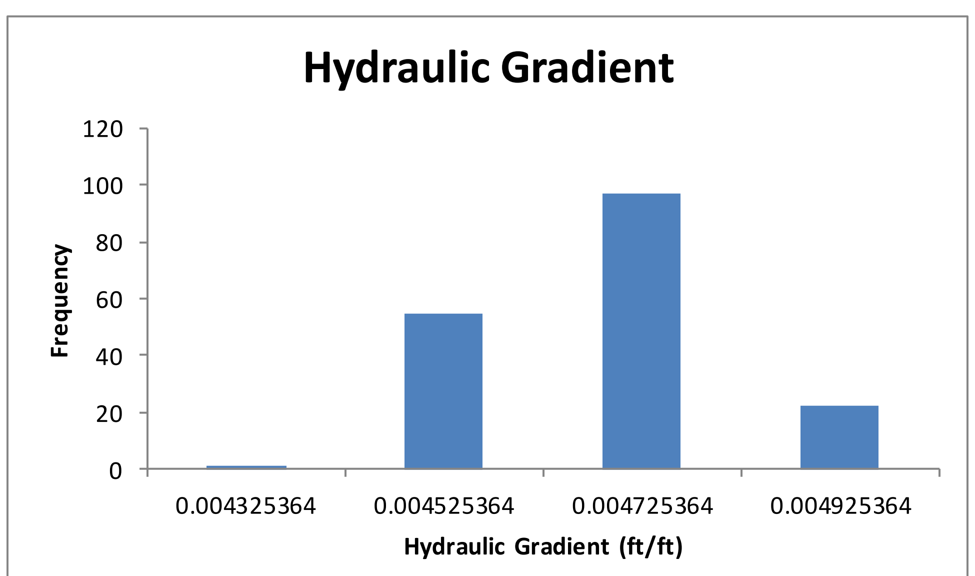
- <0.004768 or (blank)
- 0.004768-0.004968
- 0.004968-0.005168
- 0.005168-0.005368
- 0.005368-0.005568



Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

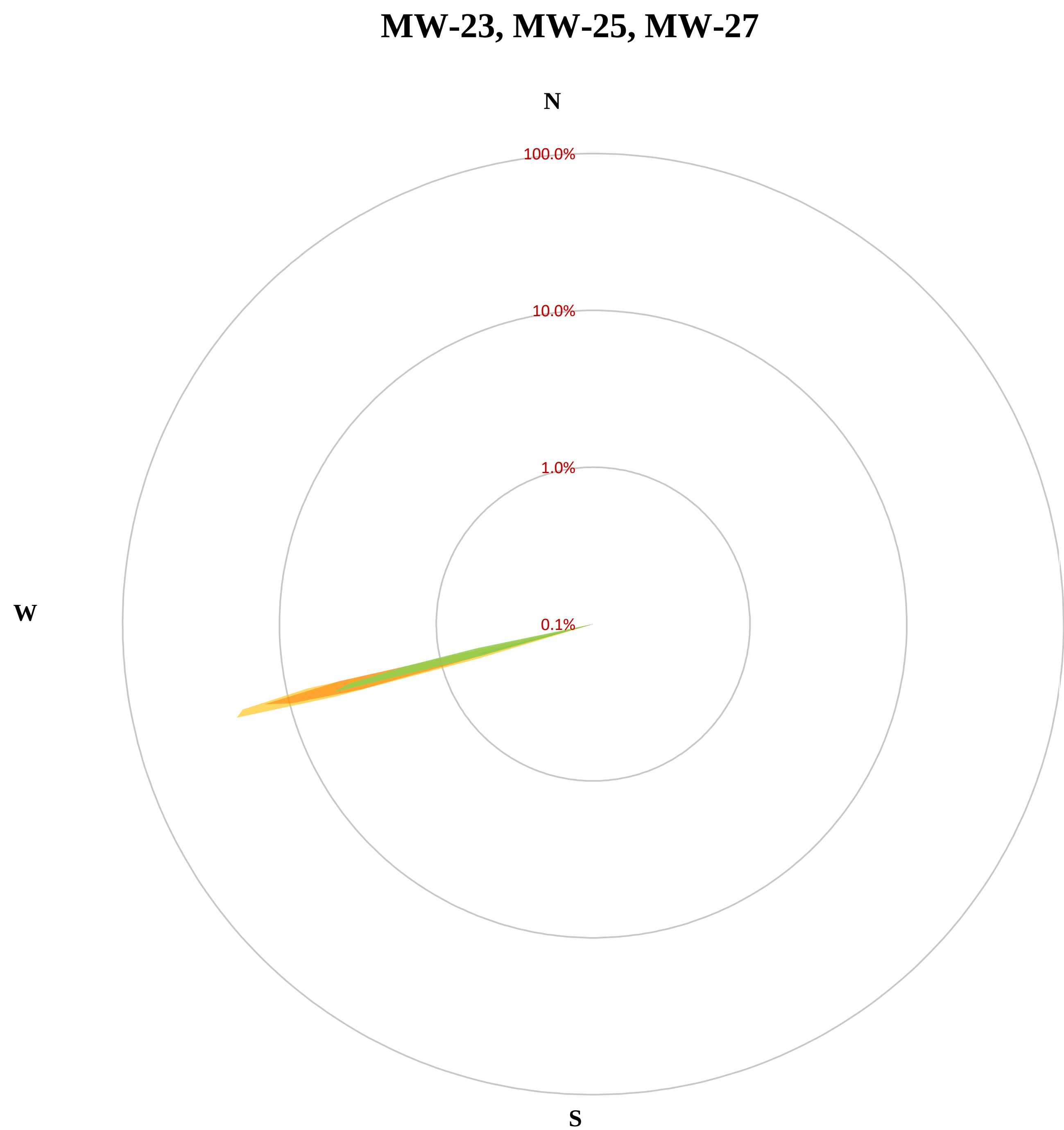


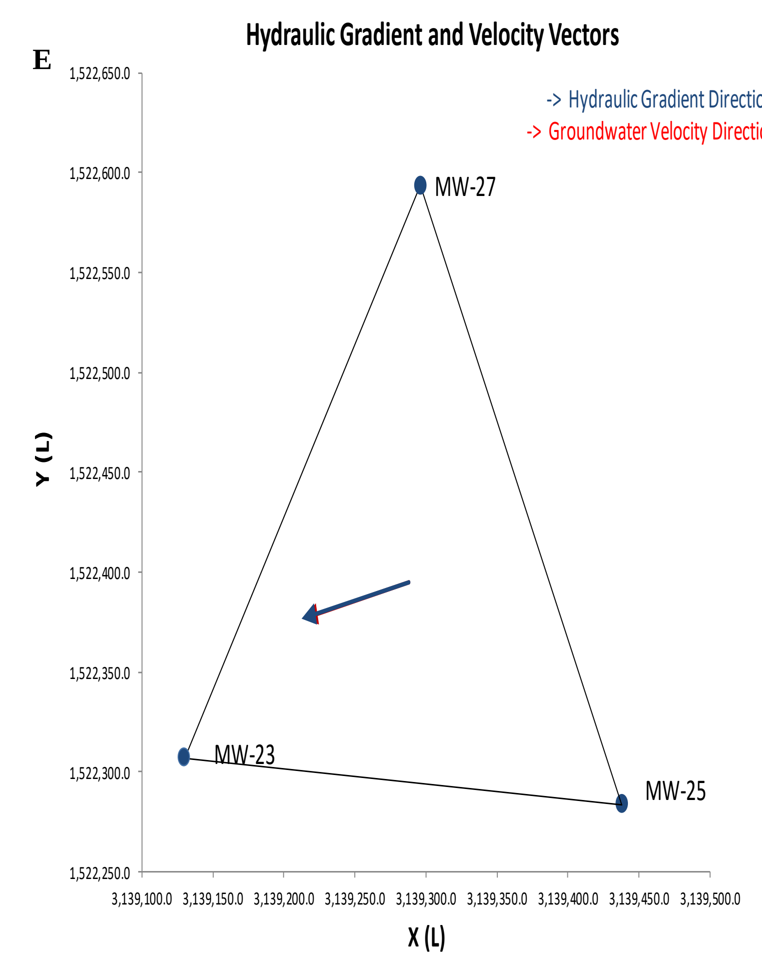




Hydraulic Gradient	
Min	0.0043254
Max	0.0048964
Average	0.0045769
Count	175

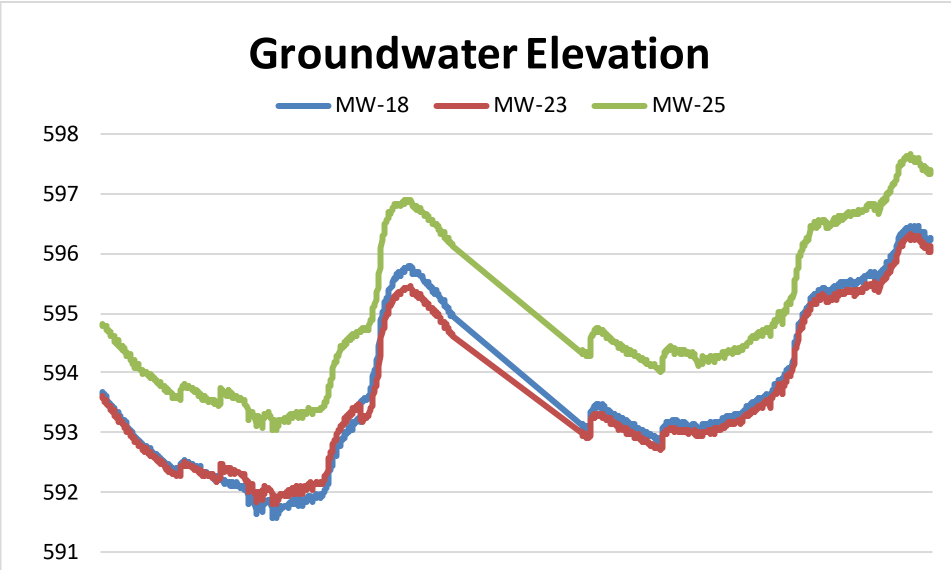
Direction	
Min	255
Max	260
Average	258
Count	175

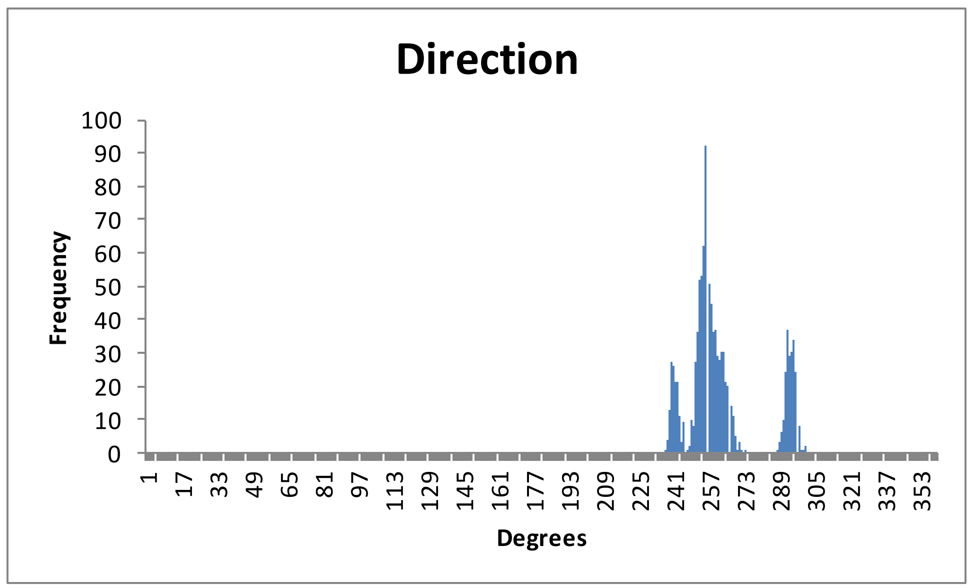


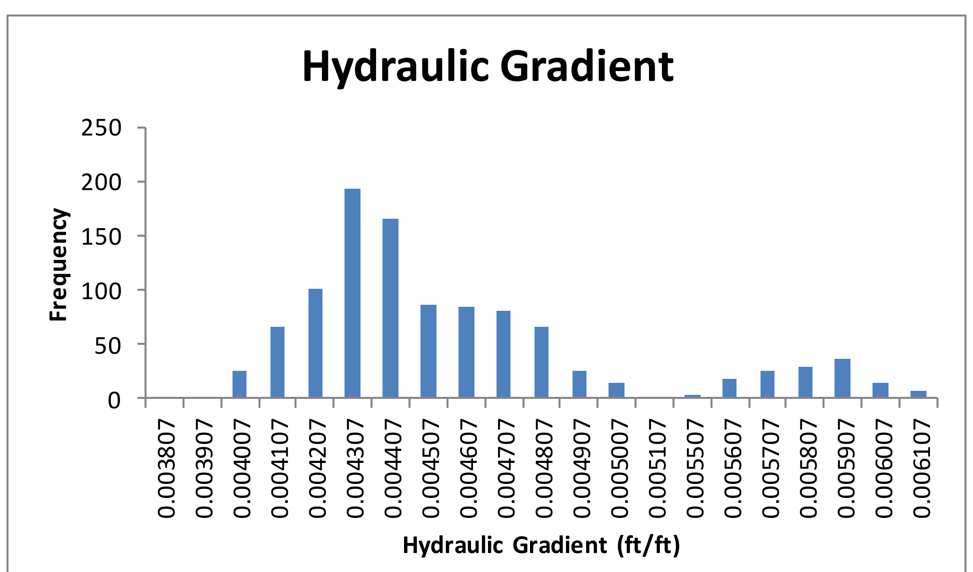


Data Collected: September 1, 2018 through November 27, 2018

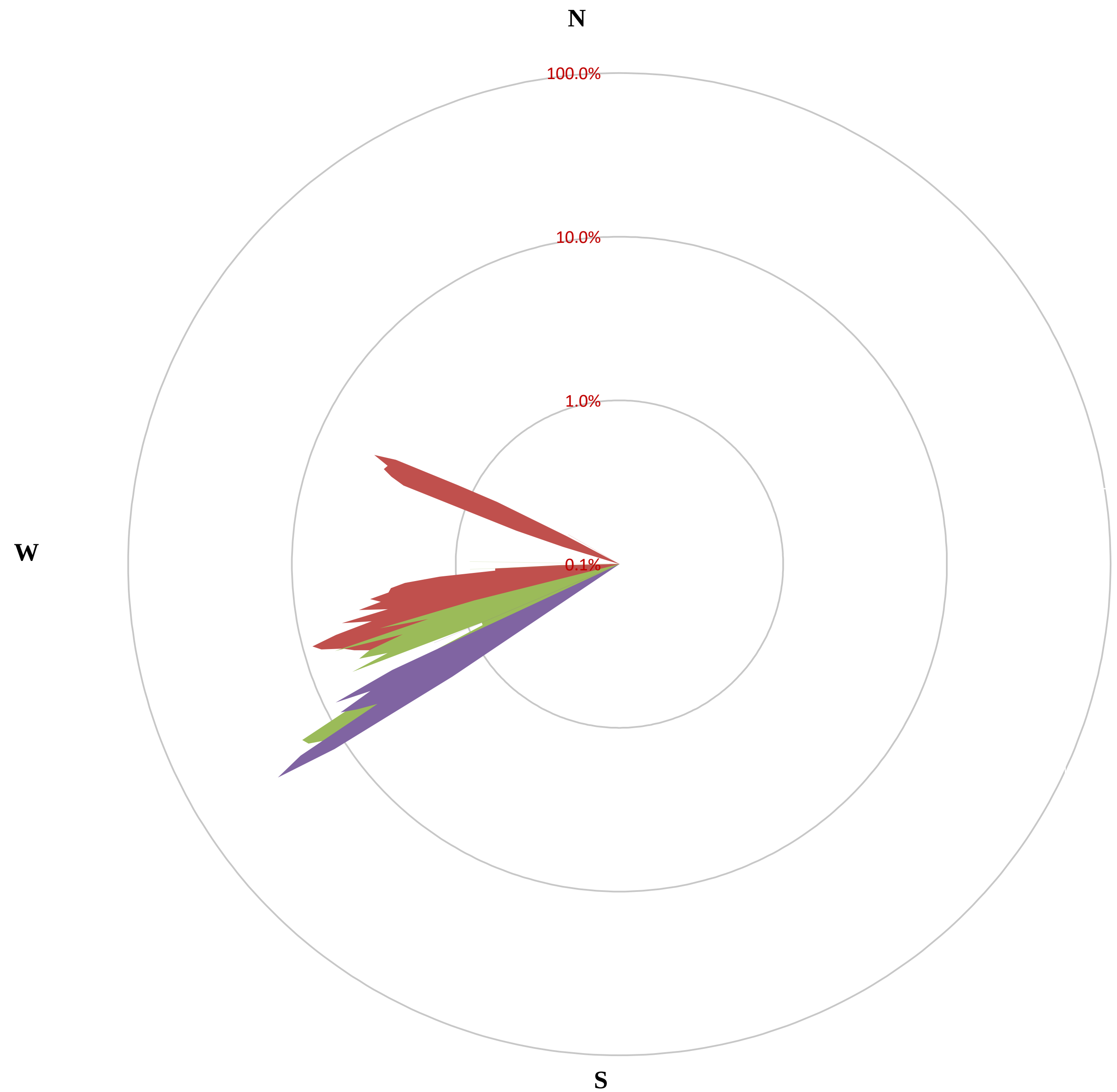
Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana







MW-18, MW-23, MW-25

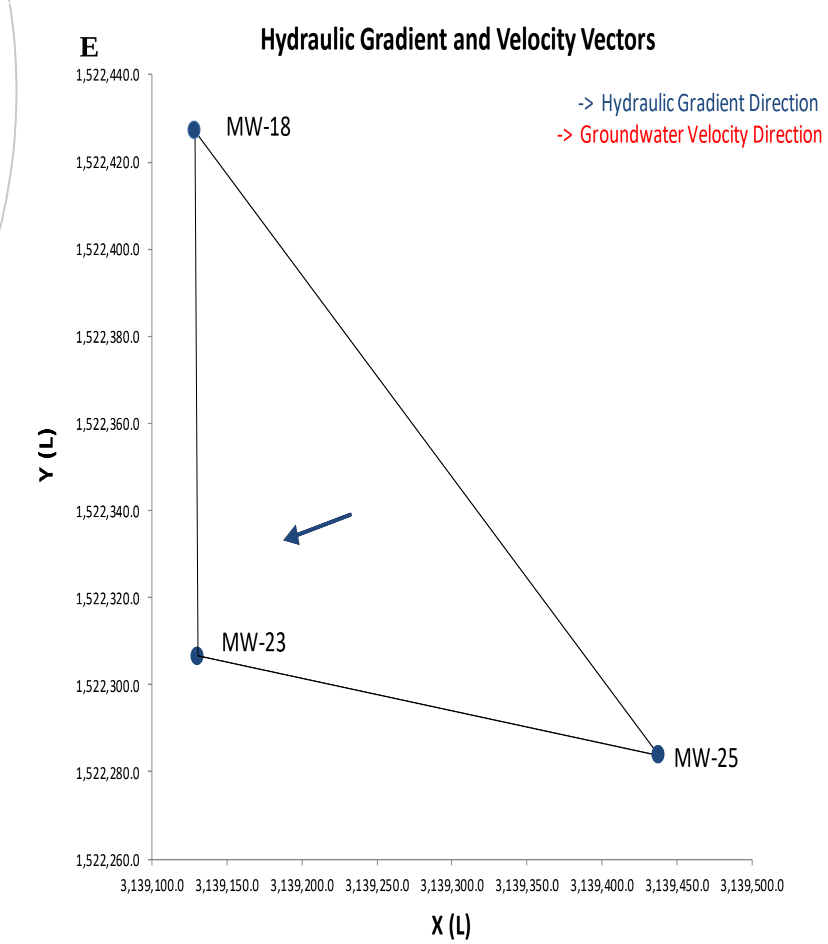


Direction	
Min	237
Max	301
Average	262
Count	1052

Hydraulic Gradient	
Min	0.003807
Max	0.006075
Average	0.004568
Count	1052

Hydraulic Gradient (ft/ft)

- 0.00381-0.00481
- 0.00481-0.00581
- 0.00581-0.00681

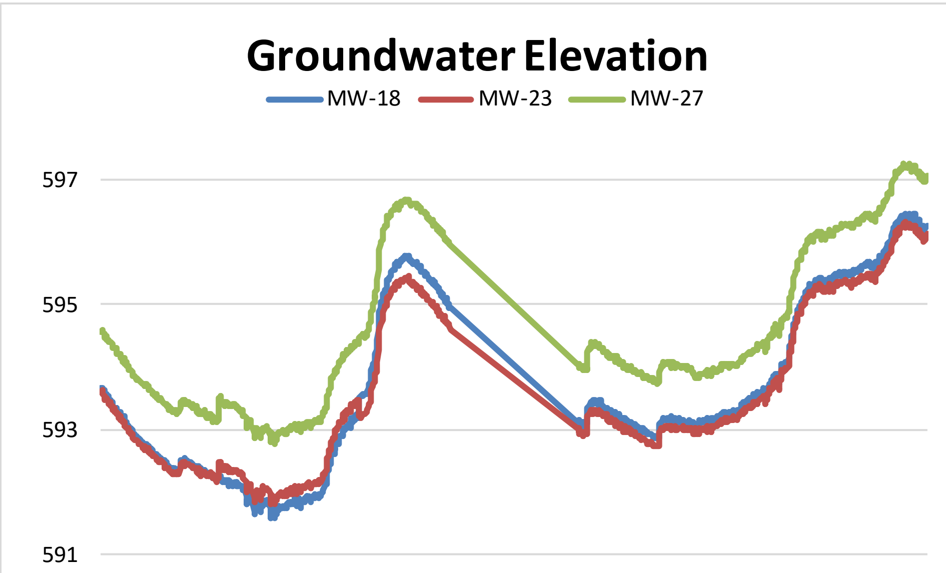


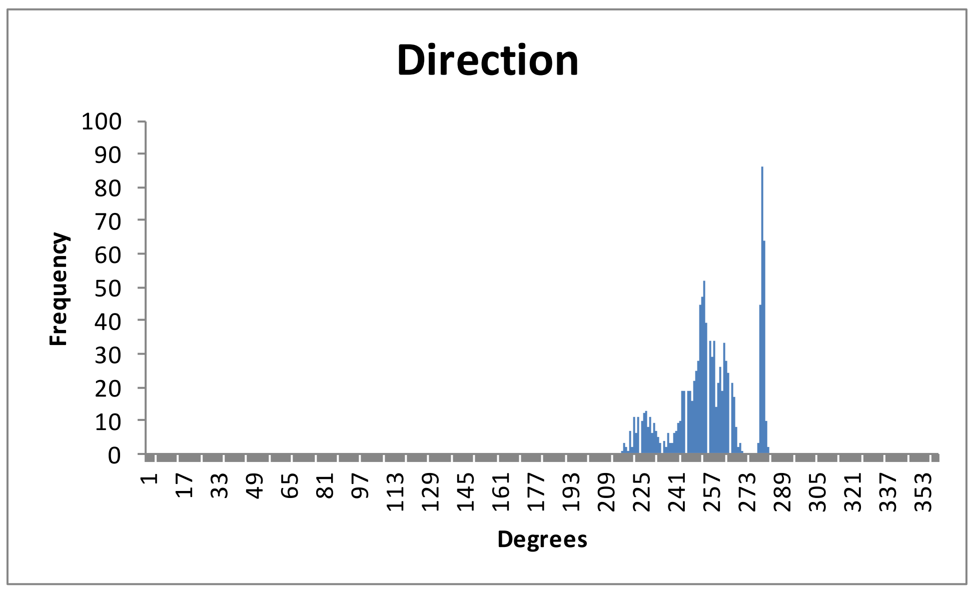
Data Collected: September 8, 2017-May 29, 2018 and September 1, 2018-May 22, 2019

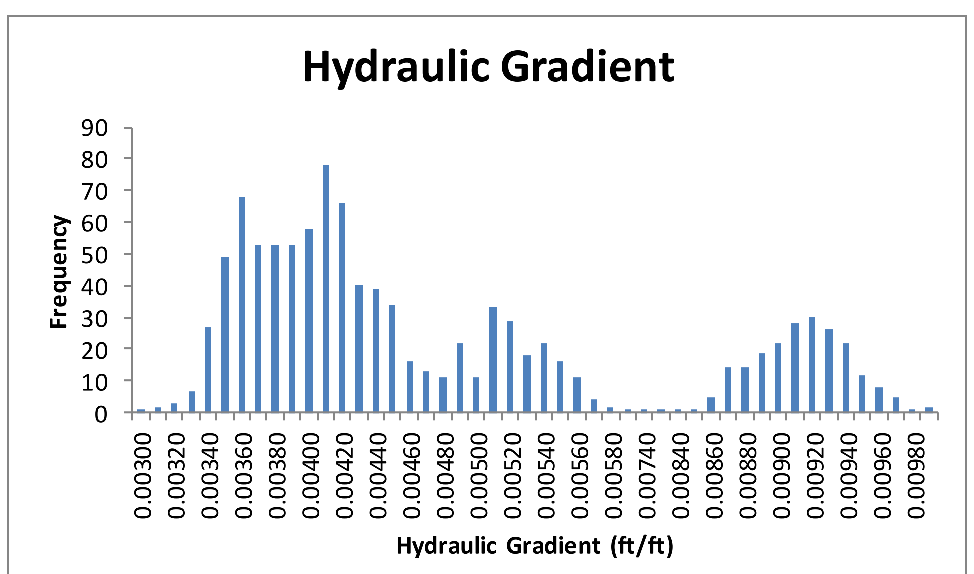
Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

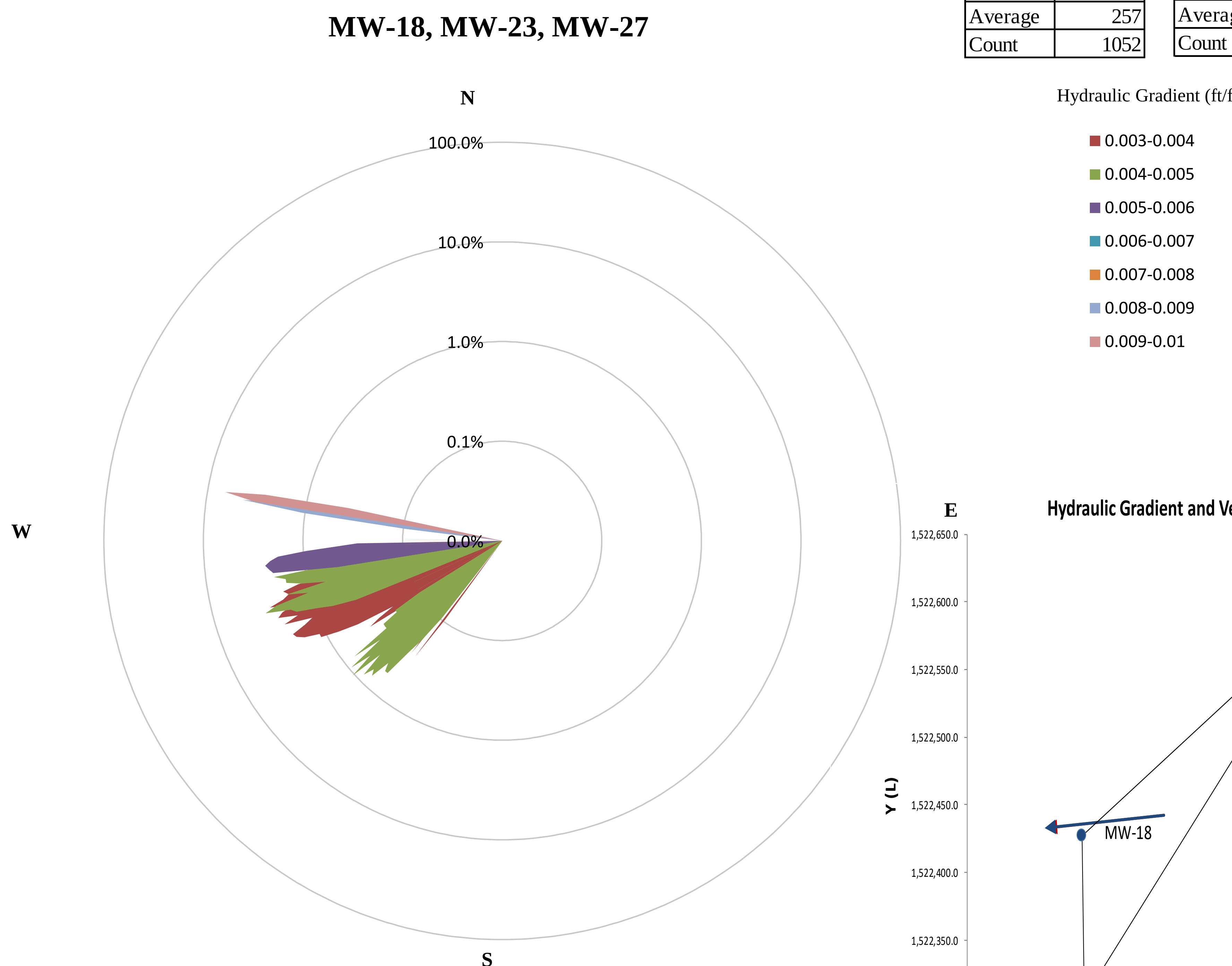
Direction	
Min	217
Max	283
Average	257
Count	1052

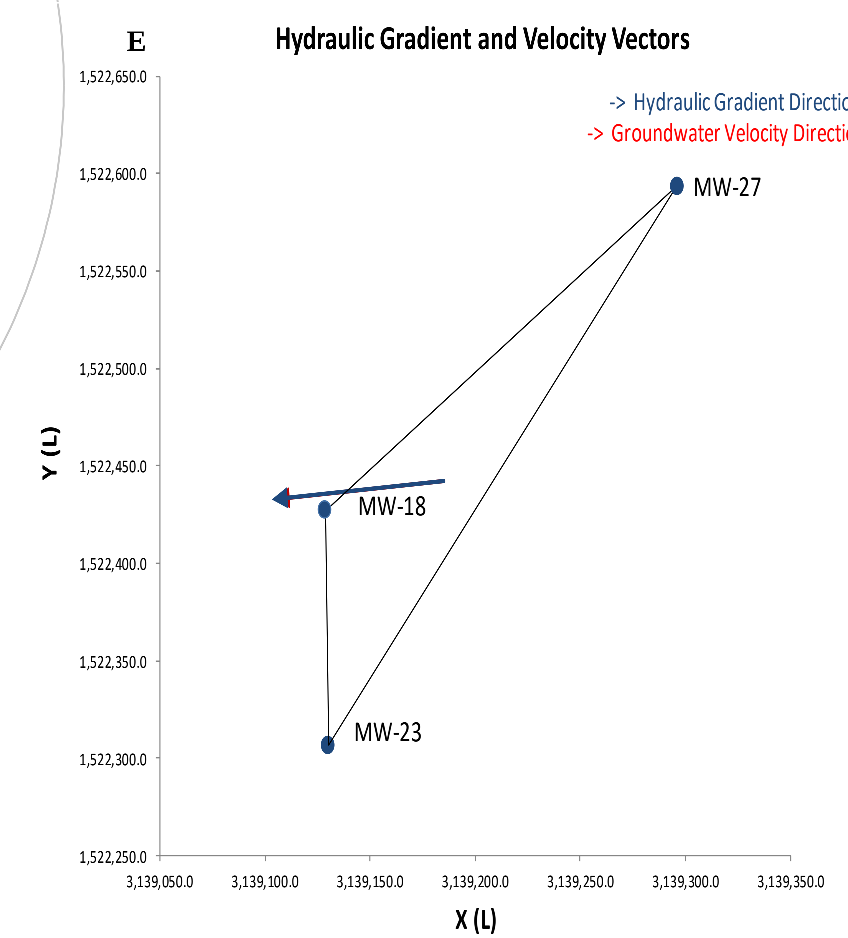
Hydraulic Gradient	
Min	0.00300
Max	0.0098616
Average	0.00517
Count	1052





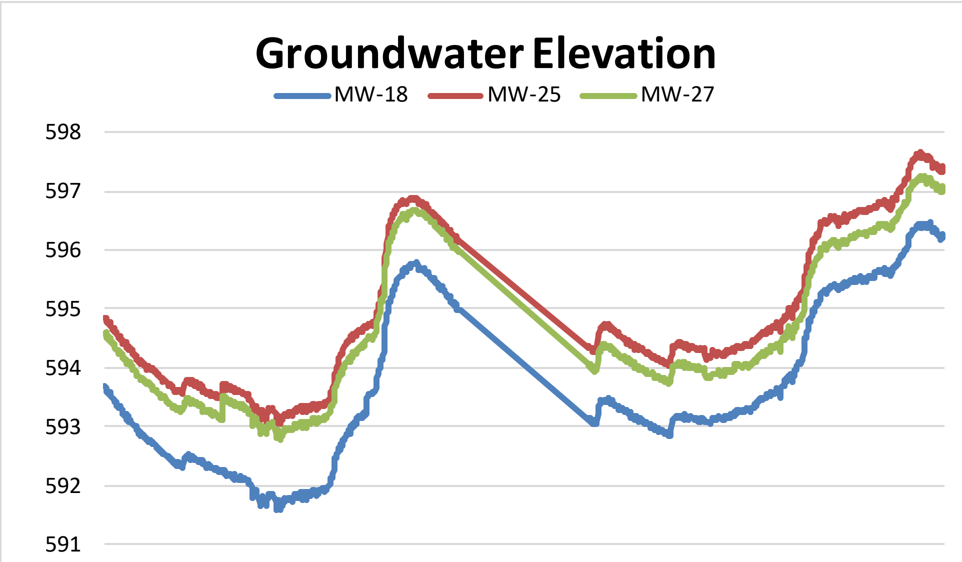


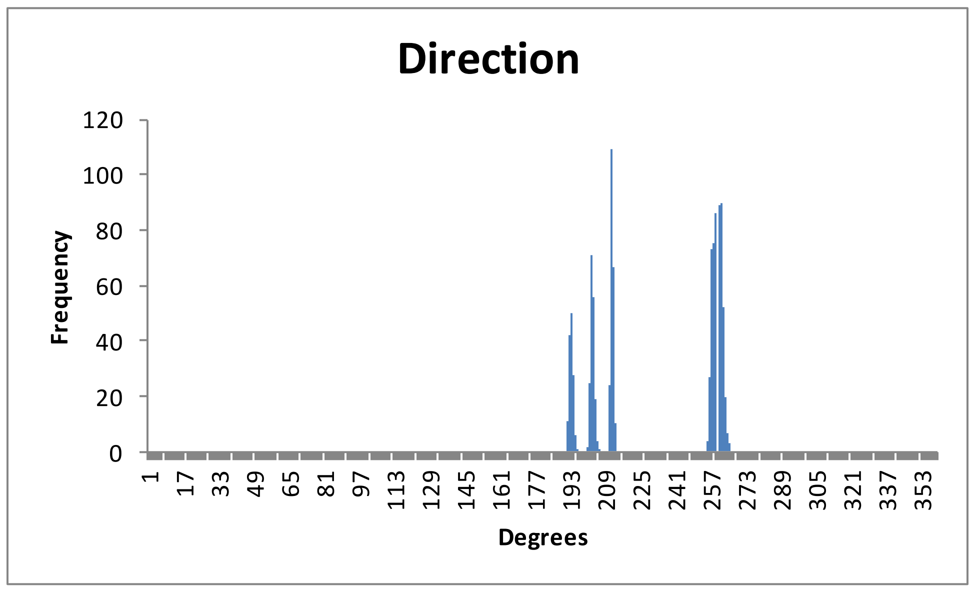


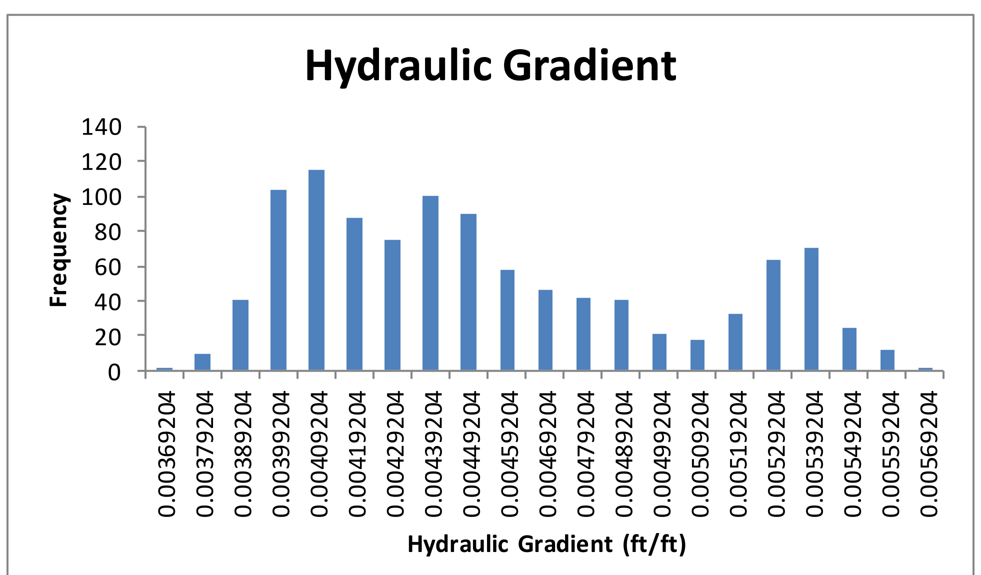


Data Collected: September 8, 2017-May 29, 2018 and September 1, 2018-May 22, 2019

Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

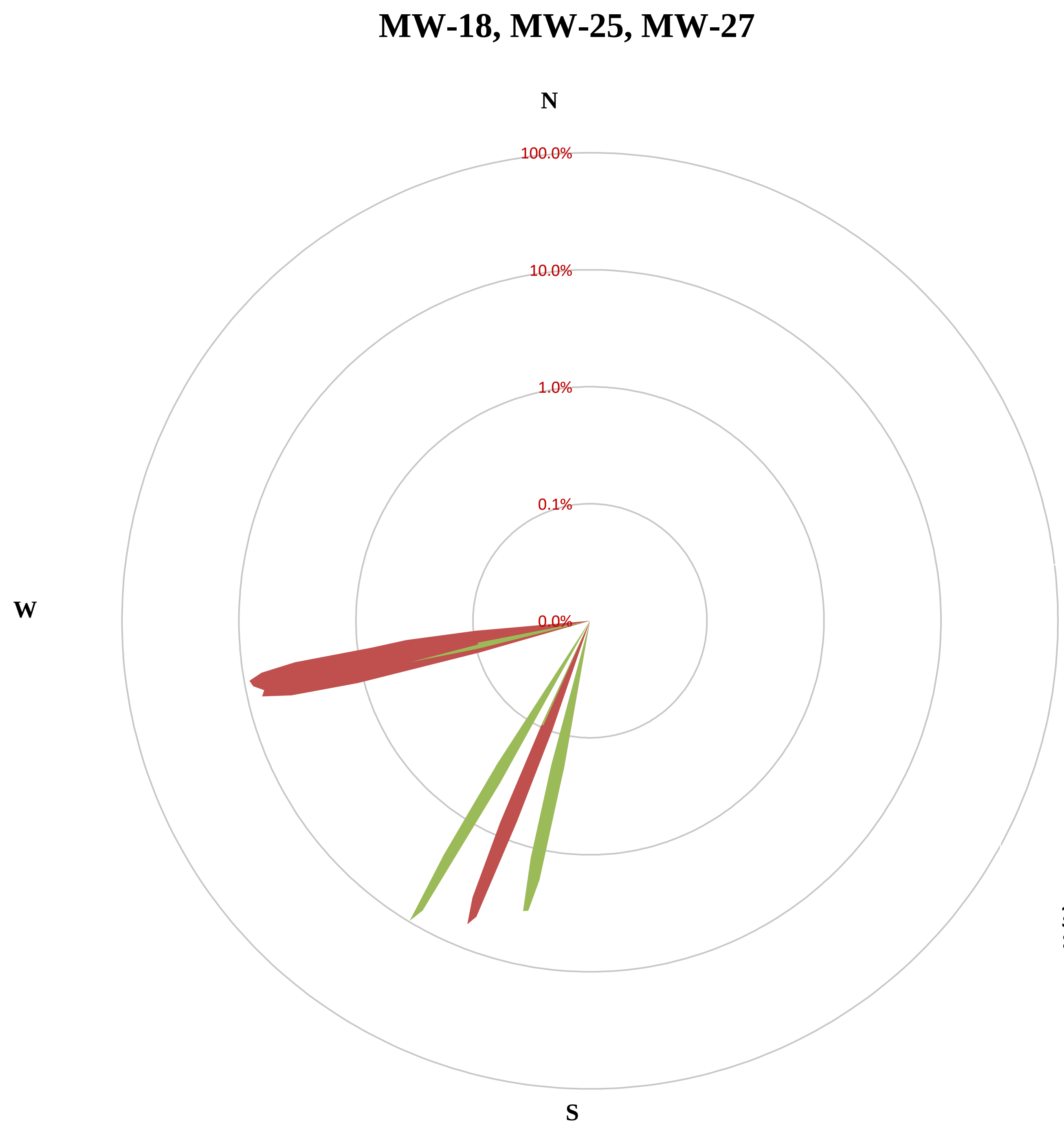


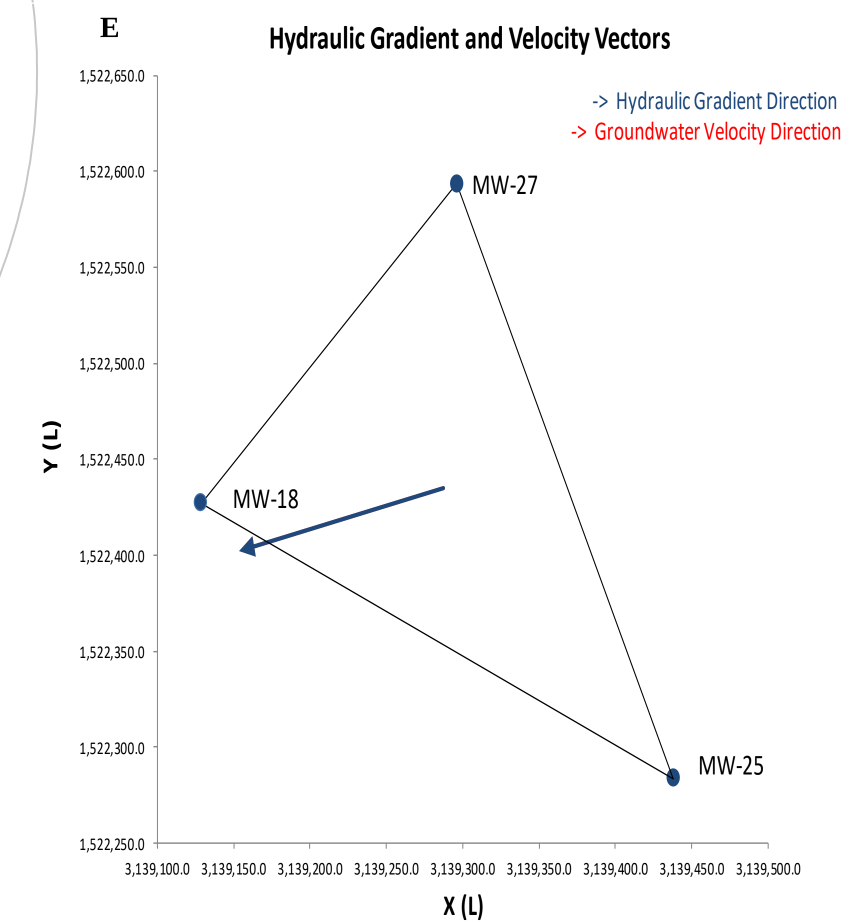




Hydraulic Gradient	
Min	0.003692
Max	0.005685
Average	0.0045
Count	1052

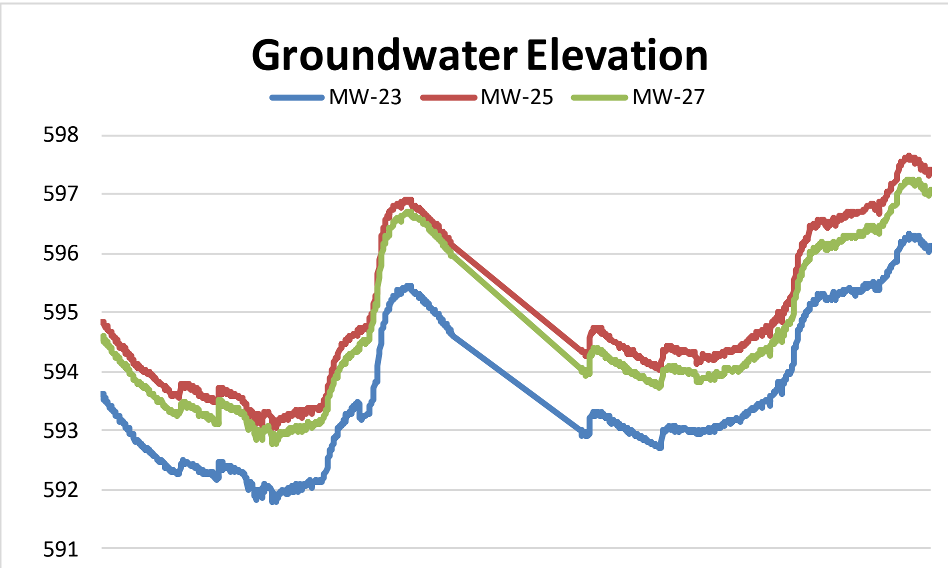
Direction	
Min	191
Max	266
Average	232
Count	1052

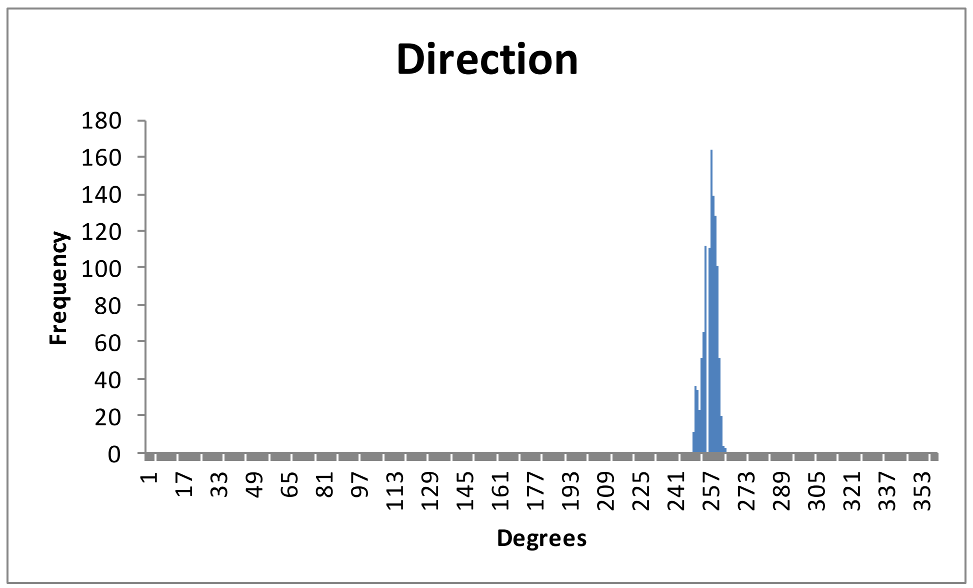


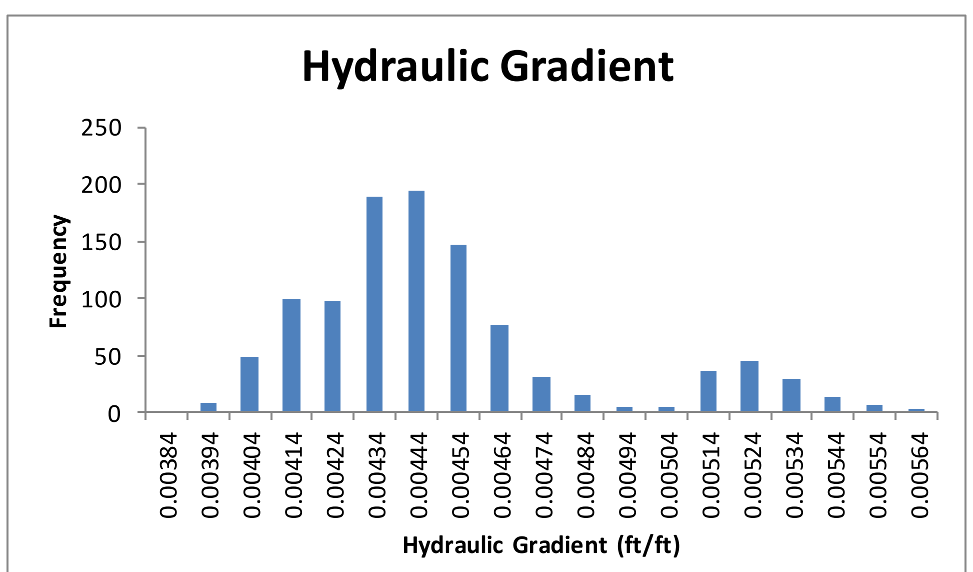


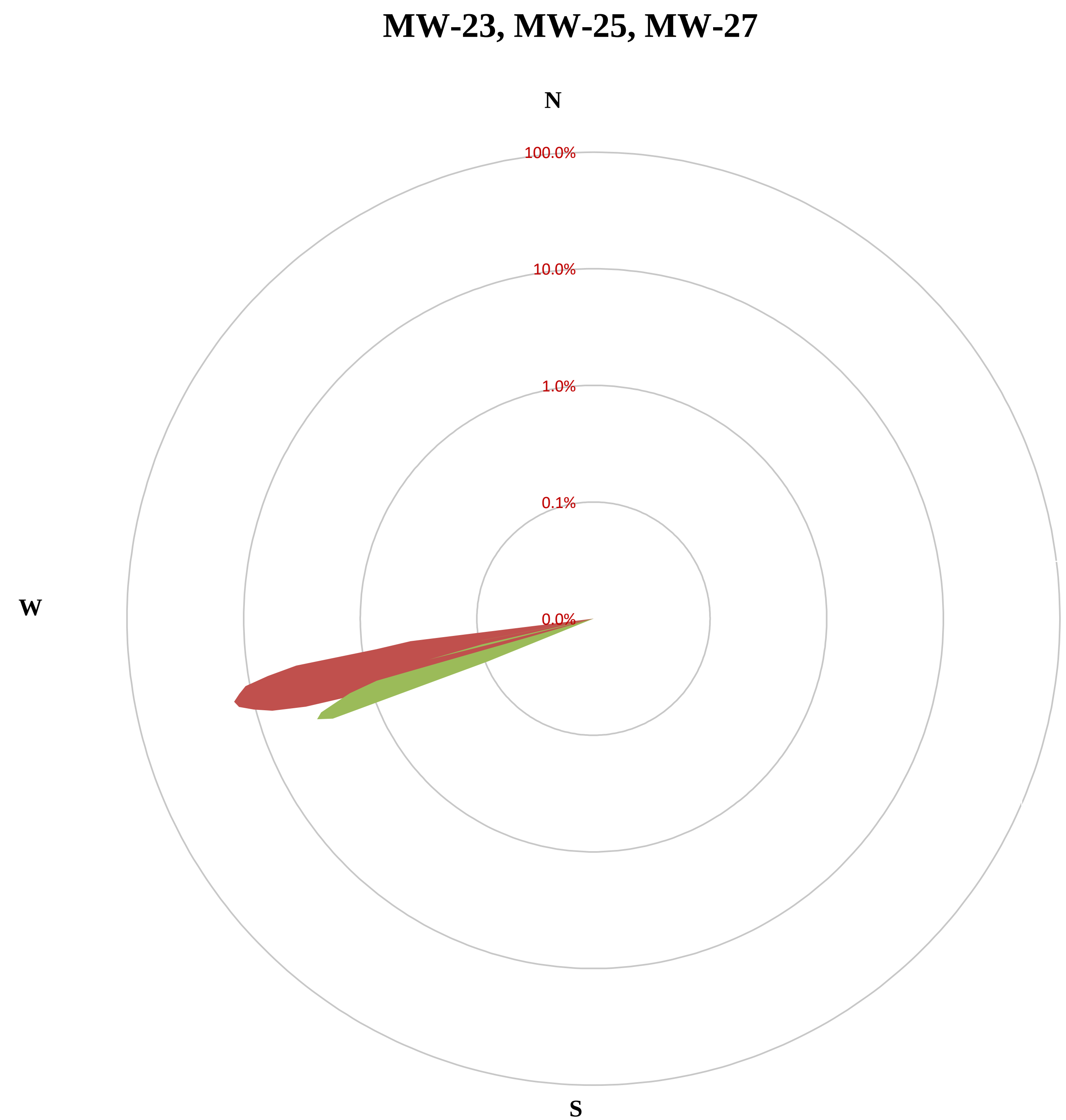
Data Collected: September 8, 2017-May 29, 2018 and September 1,2018- May 22, 2019

Groundwater Flow Direction and Magnitude
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana









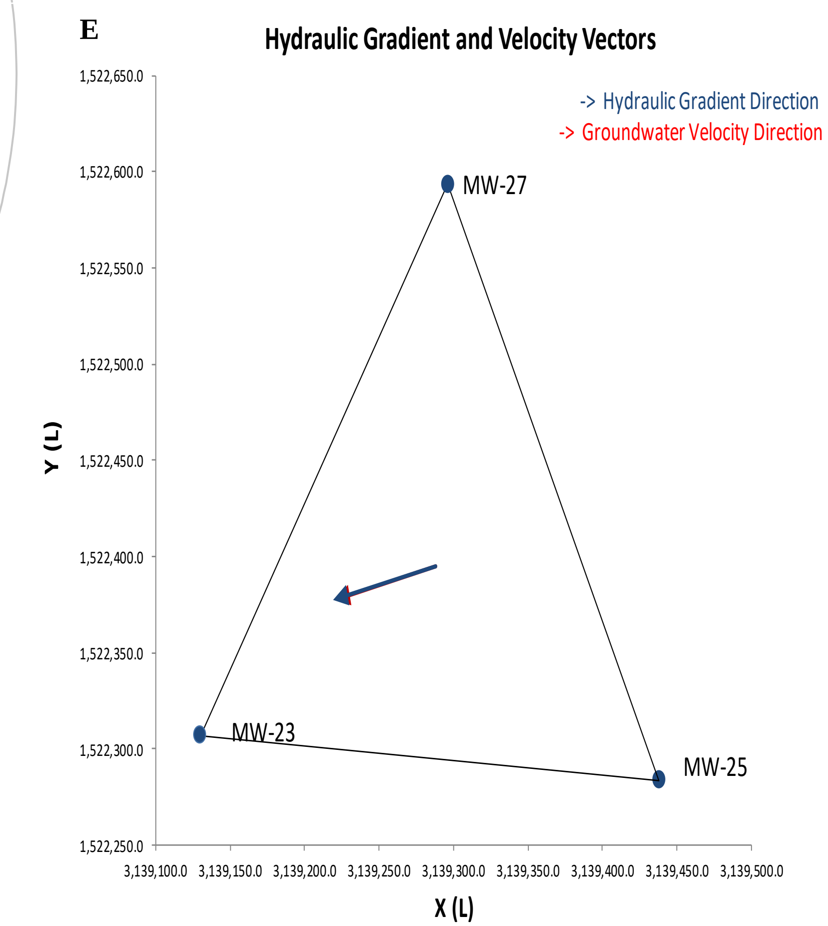
Data Collected: September 8, 2017-May 29, 2018 and September 1, 2018-May 22, 2019

Hydraulic Gradient	
Min	0.00384
Max	0.00559
Average	0.00446
Count	1052

Direction	
Min	249
Max	264
Average	257
Count	1052

Hydraulic Gradient (ft/ft)
- 0.00384-0.00484
- 0.00484-0.00584

E



APPENDIX J

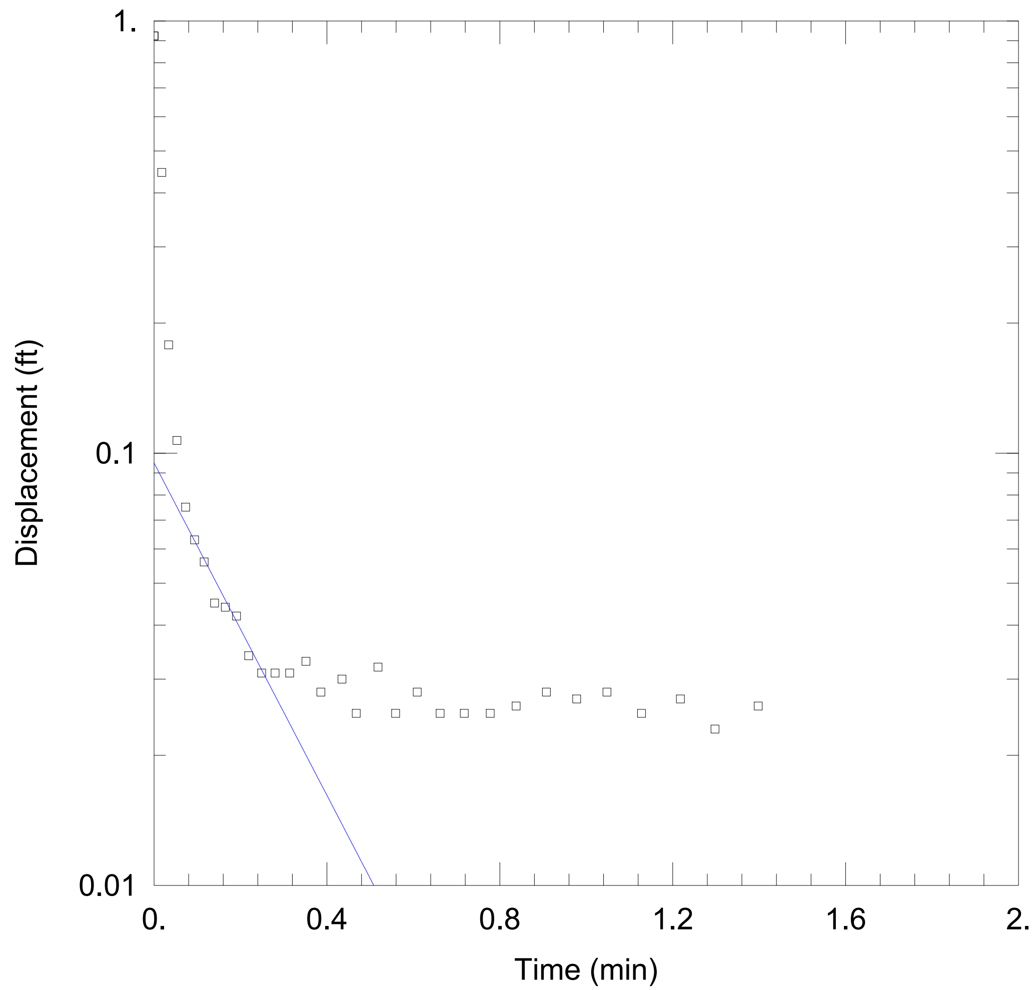
Slug Test Data

Summary of Slug Test Data
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

Well ID	Test	Hydraulic Conductivity		Textural Hydraulic Conductivity	
		Ft/Day	Cm/Sec	Saturated Textures	Hydraulic Conductivity Range[1]
MW-1	R1	12.010	4.24E-03	3.419	1.21E-03
	R2	14.400	5.08E-03	2.664	9.40E-04
	R3	20.680	7.30E-03	3.085	1.09E-03
	Average	15.697	5.54E-03	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	15.293	5.39E-03		
	Standard Deviation	4.478	1.58E-03		
MW-15	R1	21.24	7.49E-03		
	R2	16.37	5.77E-03		
	R3	31.5	1.11E-02		
	Average	23.037	8.13E-03	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	22.208	7.83E-03		
	Standard Deviation	7.723	2.72E-03		
MW-22	R1	46.22	1.63E-02		
	R2	66.58	2.35E-02		
	R3	56.57	2.00E-02		
	Average	56.457	1.99E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	55.837	1.97E-02		
	Standard Deviation	10.180	3.59E-03		
MW-24	R1	54.42	1.92E-02		
	R2	62.89	2.22E-02		
	R3	56.89	2.01E-02		
	Average	58.067	2.05E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	57.960	2.04E-02		
	Standard Deviation	4.356	1.54E-03		
MW-26	R1	28.83	1.02E-02		
	R2	39.46	1.39E-02		
	R3	35.95	1.27E-02		
	Average	34.747	1.23E-02	Silty sand, poorly graded sand, and well graded sand	2.83 ft/day to 283.5 ft/day or 10^{-3} to 10^{-1} cm/sec
	Geometric Mean	34.454	1.22E-02		
	Standard Deviation	5.416	1.91E-03		

Site	Average	37.601	1.12E-02
	Geometric Mean	37.15	1.098E-02
	Standard Deviation	6.43	2.632E-03

[1] Textural hydraulic conductivity range based on log descriptions and representative values illustrated in Freeze and Cherry (1979), page 29.



MW-9 RISING 1

Data Set: Q:\...\MW-9 Rising 1.aqt
Date: 08/24/17 Time: 11:20:29

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-9
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 50.64 ft
Anisotropy Ratio (Kz/Kr): 1.

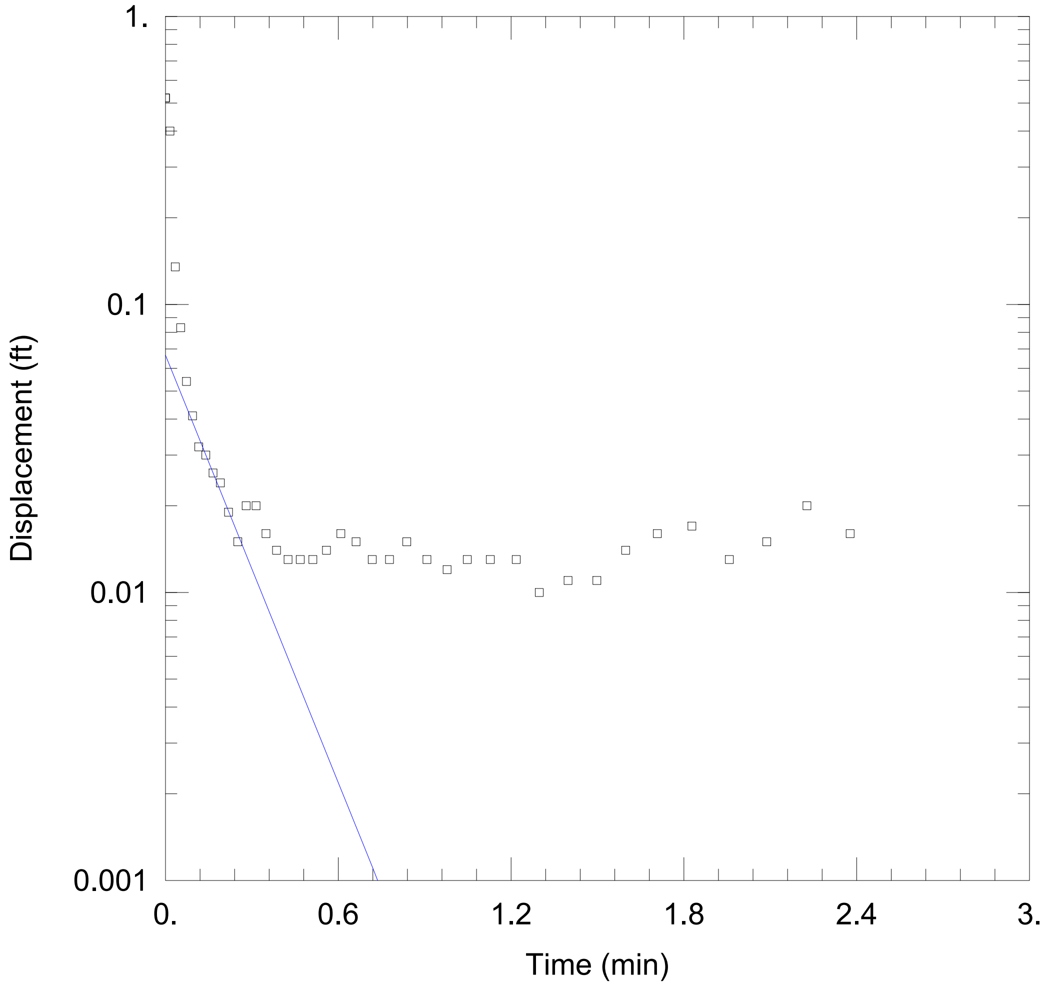
WELL DATA (MW-9)

Initial Displacement: 0.923 ft
Total Well Penetration Depth: 6.35 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 6.35 ft
Screen Length: 6.35 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 39.75 ft/day
y0 = 0.09488 ft



MW-9 RISING 2

Data Set: Q:\...\MW-9 Rising 2.aqt
Date: 08/24/17 Time: 10:17:50

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-9
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 50.58 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

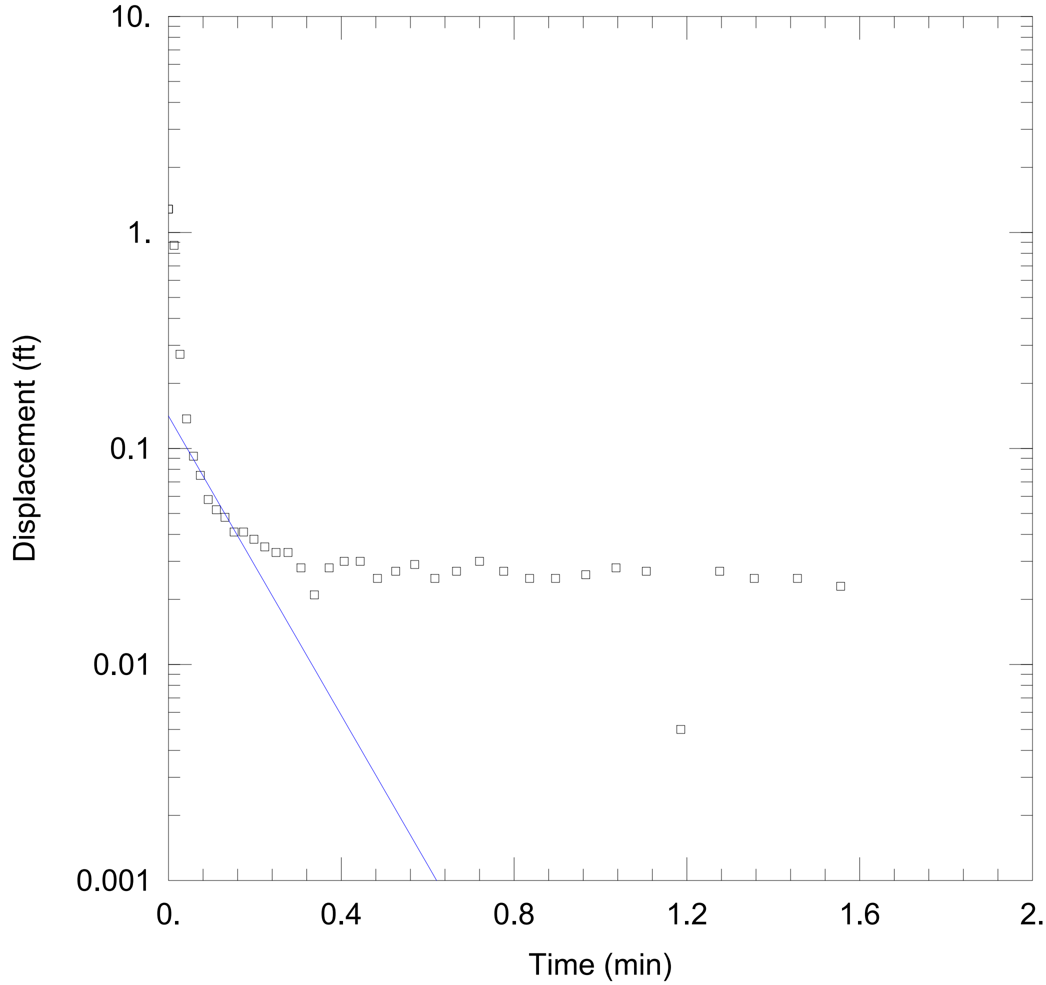
Initial Displacement: 0.521 ft
Total Well Penetration Depth: 6.29 ft
Casing Radius: 0.0833 ft

Static Water Column Height: 6.29 ft
Screen Length: 6.29 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 51.42 ft/day y0 = 0.06665 ft



MW-9 RISING 3

Data Set: Q:\...\MW-9 Rising 3.aqt
Date: 08/24/17 Time: 09:58:56

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-9
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 50.61 ft Anisotropy Ratio (Kz/Kr): 1.

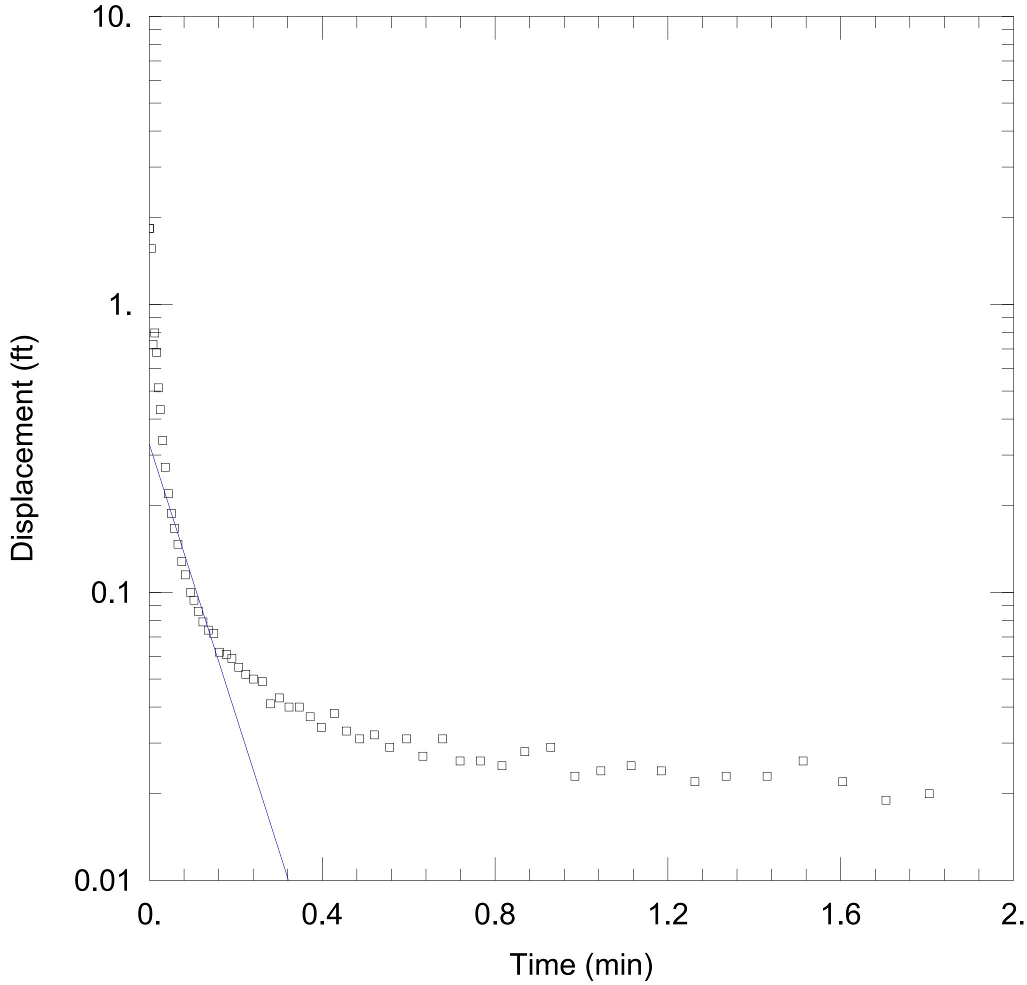
WELL DATA (MW-9)

Initial Displacement: 1.281 ft
Total Well Penetration Depth: 6.32 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 6.32 ft
Screen Length: 6.32 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 71.81 ft/day y0 = 0.1411 ft



MW-15 RISING 1

Data Set: Q:\...\MW-15 Rising 1.aqt
Date: 08/24/17 Time: 09:57:22

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-15
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 51.85 ft Anisotropy Ratio (Kz/Kr): 1.

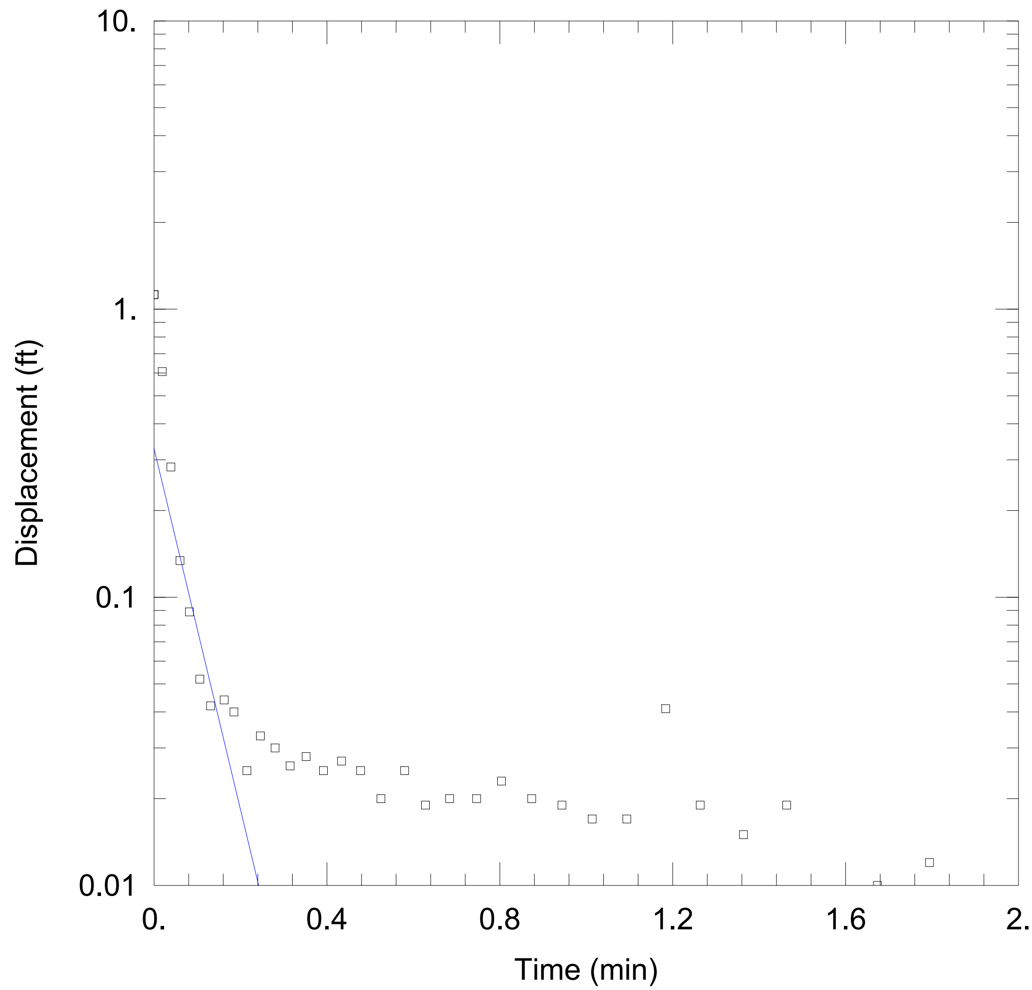
WELL DATA (MW-15)

Initial Displacement: 1.834 ft
Total Well Penetration Depth: 7.53 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.53 ft
Screen Length: 7.53 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 88.51 ft/day y0 = 0.3256 ft



MW-15 RISING 2

Data Set: Q:\...\MW-15 Rising 2.aqt
Date: 08/24/17 Time: 09:55:37

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-15
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 51.83 ft Anisotropy Ratio (Kz/Kr): 1.

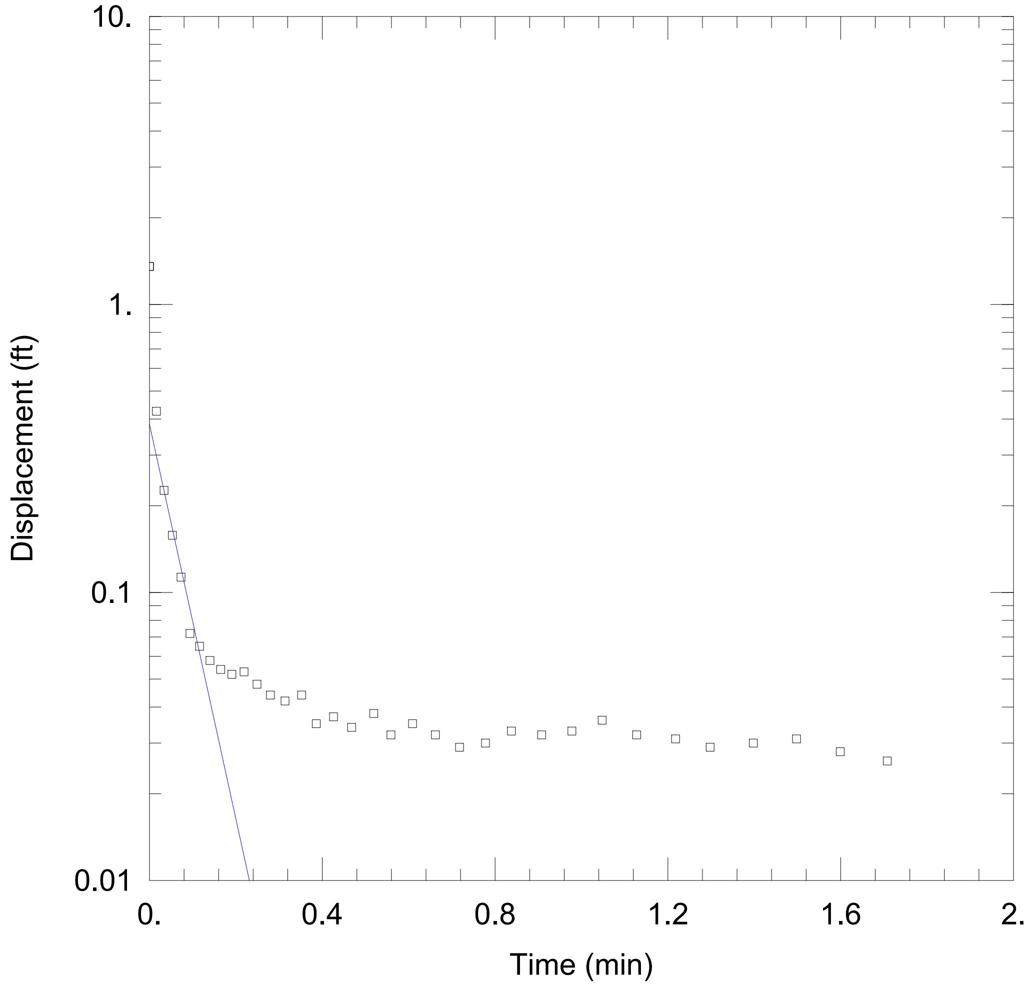
WELL DATA (MW-15)

Initial Displacement: 1.123 ft Static Water Column Height: 7.51 ft
Total Well Penetration Depth: 7.51 ft Screen Length: 7.51 ft
Casing Radius: 0.0833 ft Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 118.1 ft/day y0 = 0.3276 ft



MW-15 RISING 3

Data Set: Q:\...\MW-15 Rising 3.aqt
Date: 08/24/17 Time: 11:21:51

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-15
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 51.85 ft Anisotropy Ratio (Kz/Kr): 1.

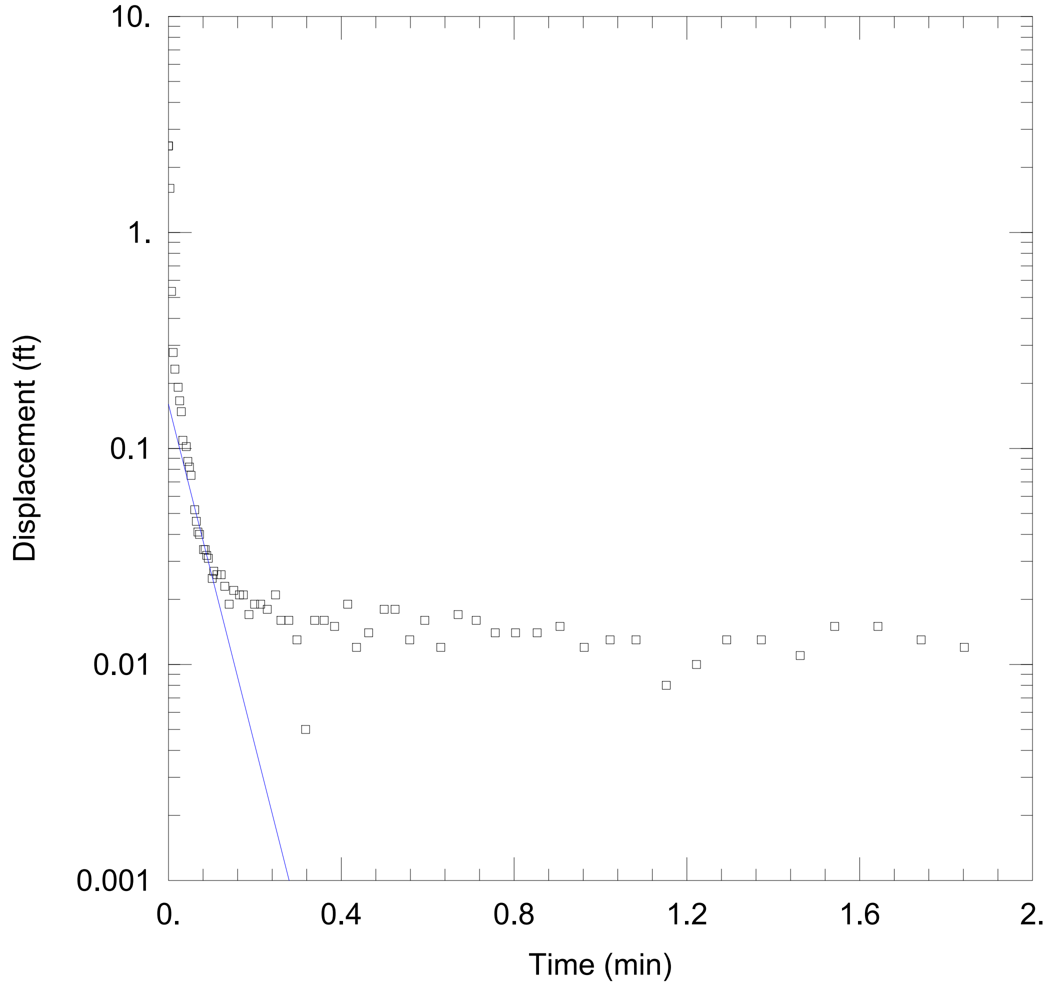
WELL DATA (MW-15)

Initial Displacement: 1.355 ft
Total Well Penetration Depth: 7.53 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.53 ft
Screen Length: 7.53 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 129. ft/day y0 = 0.3833 ft



MW-22 RISING 1

Data Set: Q:\...\MW-22 Rising 1.aqt
Date: 08/24/17 Time: 11:23:04

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-22
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 48.23 ft Anisotropy Ratio (Kz/Kr): 1.

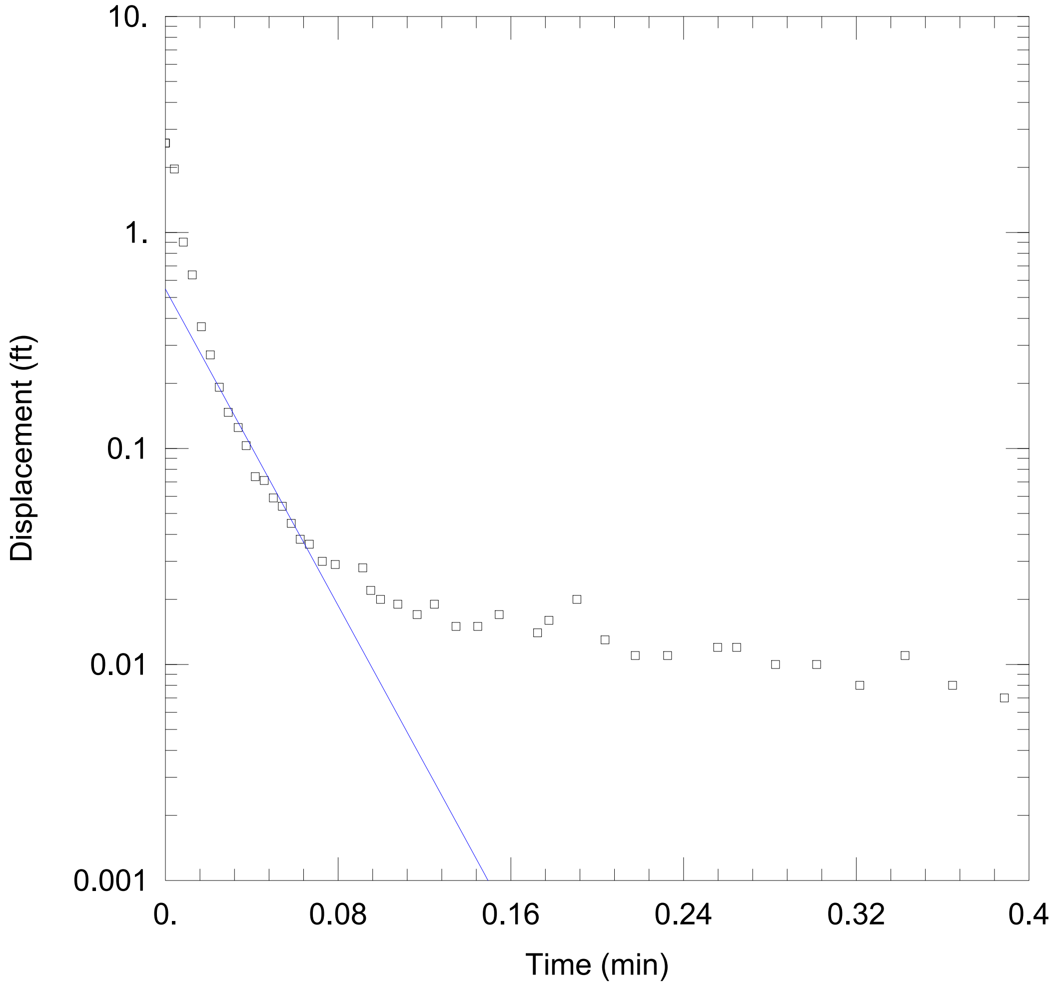
WELL DATA (MW-22)

Initial Displacement: 2.516 ft
Total Well Penetration Depth: 7.73 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.73 ft
Screen Length: 7.73 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 146.8 ft/day y0 = 0.1598 ft



MW-22 RISING 2

Data Set: Q:\...\MW-22 Rising 2.aqt
Date: 08/24/17 Time: 11:26:32

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-22
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 48.22 ft Anisotropy Ratio (Kz/Kr): 1.

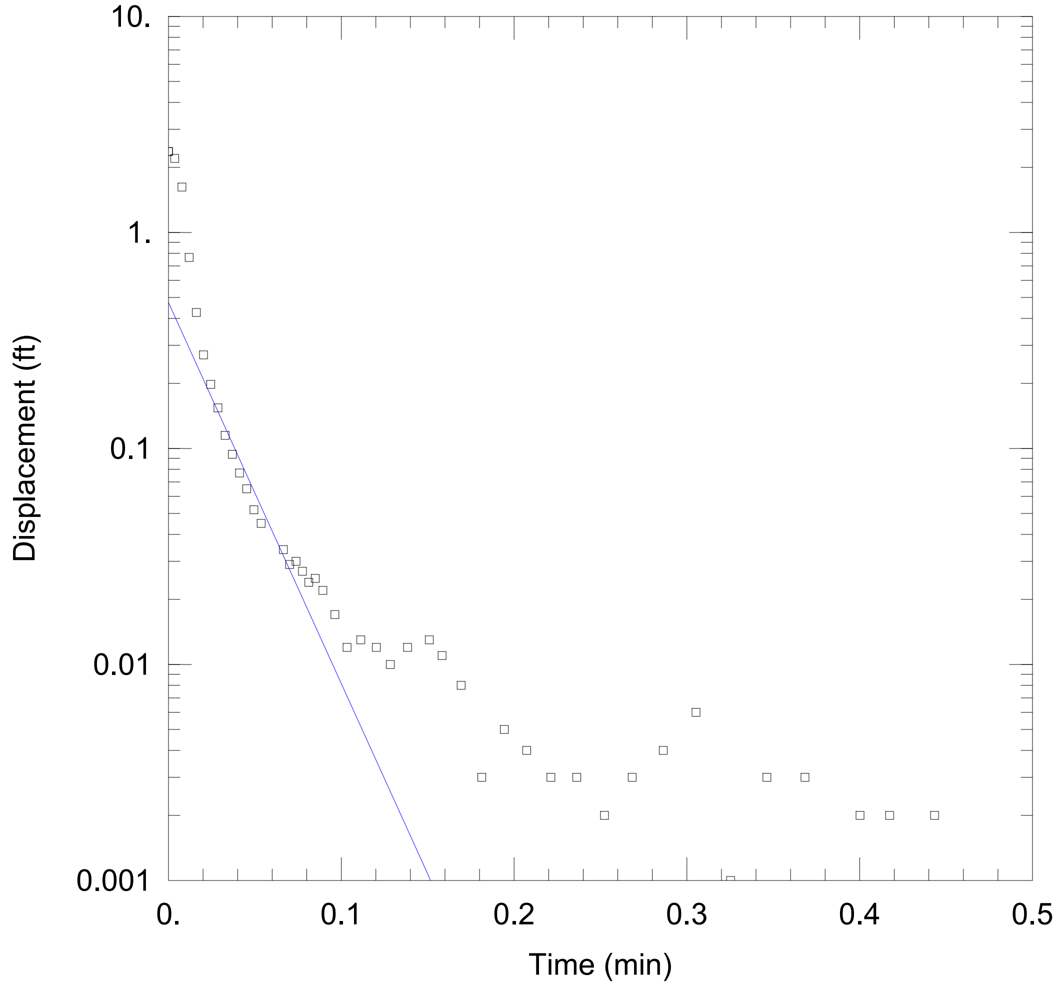
WELL DATA (MW-22)

Initial Displacement: 2.594 ft
Total Well Penetration Depth: 7.72 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.72 ft
Screen Length: 7.72 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 341.1 ft/day y0 = 0.5466 ft



MW-22 RISING 3

Data Set: Q:\...\MW-22 Rising 3.aqt
Date: 08/24/17 Time: 11:25:07

PROJECT INFORMATION

Company: Wilcox
Client: O'Neals
Project: 341.14
Location: Martinsville, IN
Test Well: MW-22
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 48.22 ft Anisotropy Ratio (Kz/Kr): 1.

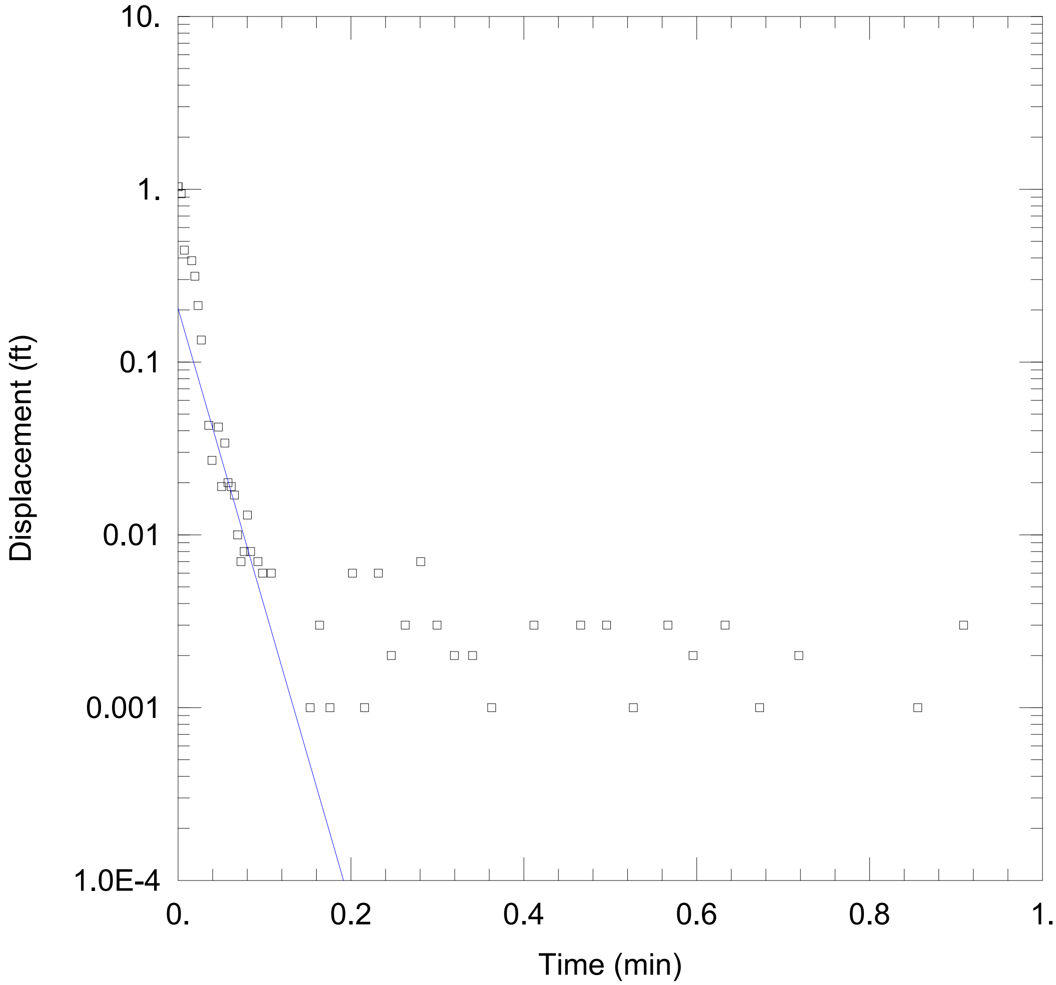
WELL DATA (MW-22)

Initial Displacement: 2.37 ft Static Water Column Height: 7.72 ft
Total Well Penetration Depth: 7.72 ft Screen Length: 7.72 ft
Casing Radius: 0.0833 ft Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 328.4 ft/day y0 = 0.4735 ft



MW-24 RISING 2

Data Set: Q:\...\MW-24 Rising 2.aqt
Date: 08/24/17 Time: 11:27:47

PROJECT INFORMATION

Company: Wilcox
Client: O'Neal's
Project: 341.14
Location: Martinsville, IN
Test Well: MW-24
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 47.97 ft Anisotropy Ratio (Kz/Kr): 1.

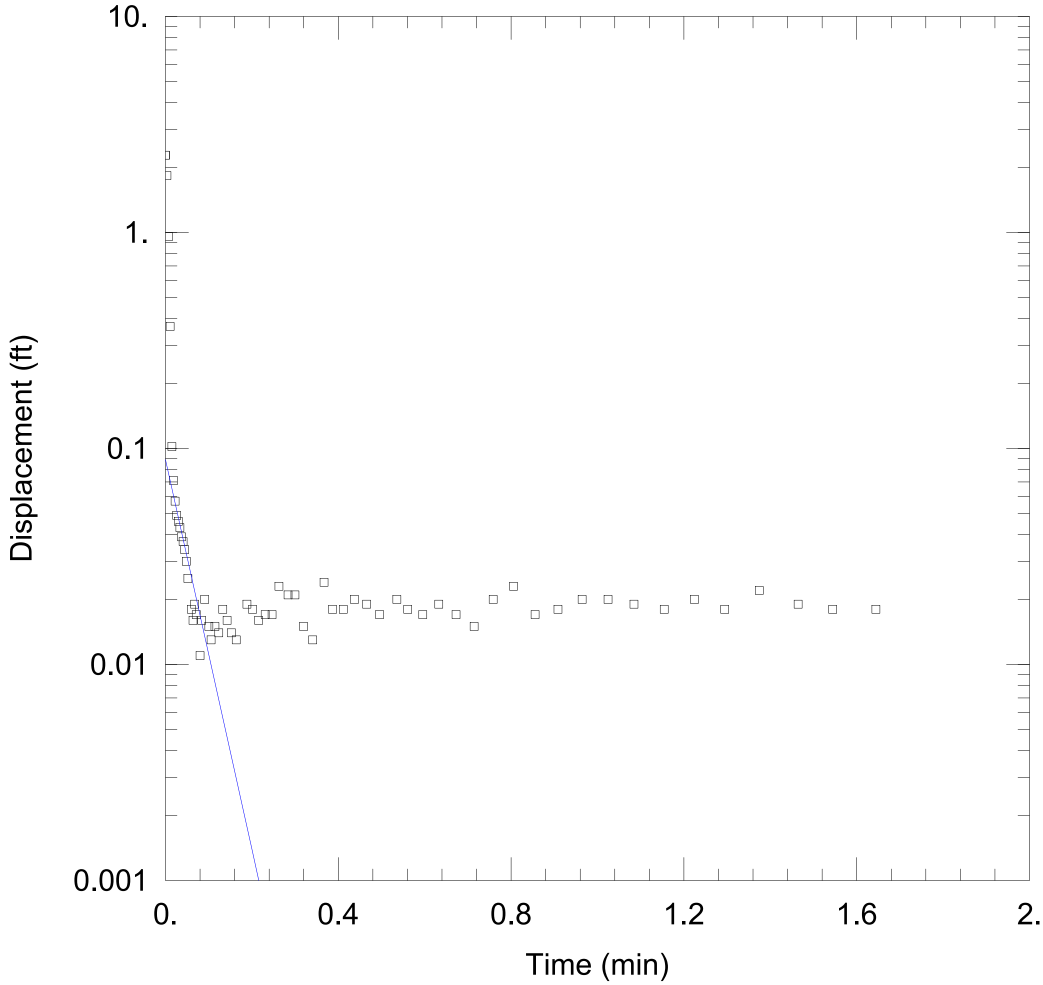
WELL DATA (MW-24)

Initial Displacement: 1.033 ft
Total Well Penetration Depth: 7.79 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.79 ft
Screen Length: 7.79 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 320.3 ft/day y0 = 0.204 ft



MW-24 RISING 4

Data Set: Q:\...\MW-24 Rising 4.aqt
Date: 08/24/17 Time: 11:29:23

PROJECT INFORMATION

Company: Wilcox
Client: O'Neal's
Project: 341.14
Location: Martinsville, IN
Test Well: MW-24
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 47.95 ft Anisotropy Ratio (Kz/Kr): 1.

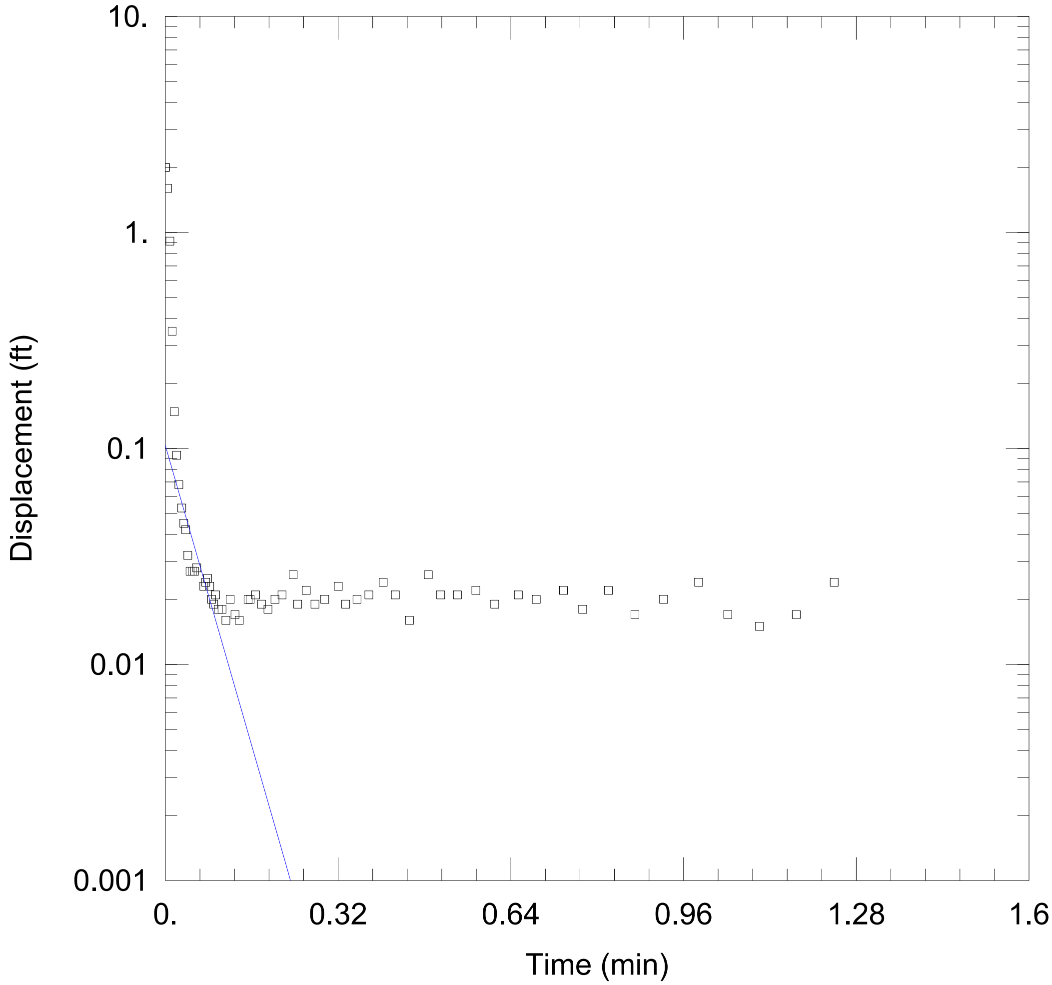
WELL DATA (New Well)

Initial Displacement: 2.276 ft Static Water Column Height: 7.77 ft
Total Well Penetration Depth: 7.77 ft Screen Length: 7.77 ft
Casing Radius: 0.0833 ft Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 167.2 ft/day y0 = 0.08869 ft



MW-24 RISING 5

Data Set: Q:\...\MW-24 Rising 5.aqt
Date: 08/24/17 Time: 11:30:25

PROJECT INFORMATION

Company: Wilcox
Client: O'Neal's
Project: 341.14
Location: Martinsville, IN
Test Well: MW-24
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 47.94 ft
Anisotropy Ratio (Kz/Kr): 1.

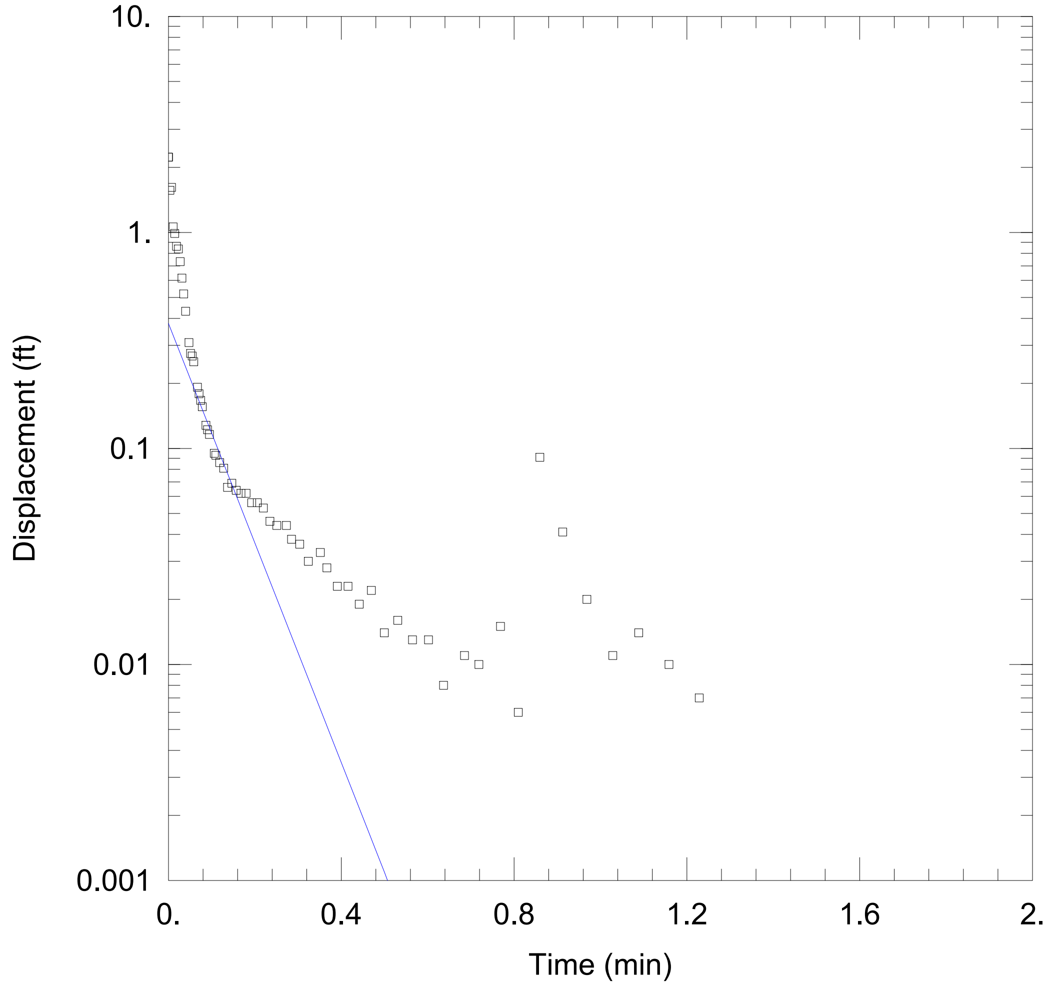
WELL DATA (MW-24)

Initial Displacement: 2. ft
Total Well Penetration Depth: 7.76 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 7.76 ft
Screen Length: 7.76 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 161.2 ft/day
y0 = 0.1029 ft



MW-26 RISING 1

Data Set: Q:\...\MW-26 Rising 1.aqt
Date: 08/24/17 Time: 11:36:01

PROJECT INFORMATION

Company: Wilcox
Client: O'Neal's
Project: 341.14
Location: Martinsville, IN
Test Well: MW-26
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 51.51 ft
Anisotropy Ratio (Kz/Kr): 1.

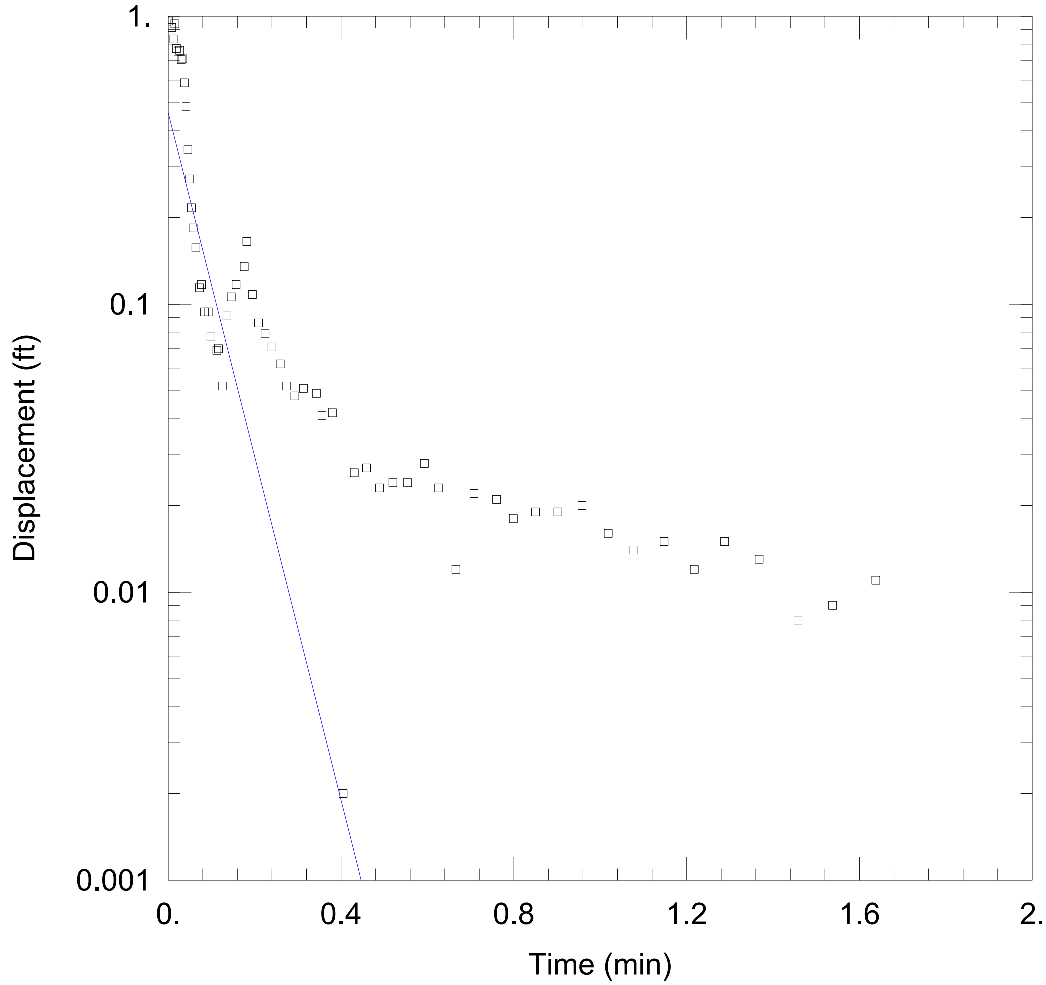
WELL DATA (MW-26)

Initial Displacement: 2.23 ft
Total Well Penetration Depth: 8.07 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 8.07 ft
Screen Length: 8.07 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 92.06 ft/day
y0 = 0.3787 ft



MW-26 RISING 2

Data Set: Q:\...\MW-26 Rising 2.aqt
Date: 08/24/17
Time: 11:34:45

PROJECT INFORMATION

Company: Wilcox
Client: O'Neal's
Project: 341.14
Location: Martinsville, IN
Test Well: MW-26
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 51.53 ft
Anisotropy Ratio (Kz/Kr): 1.

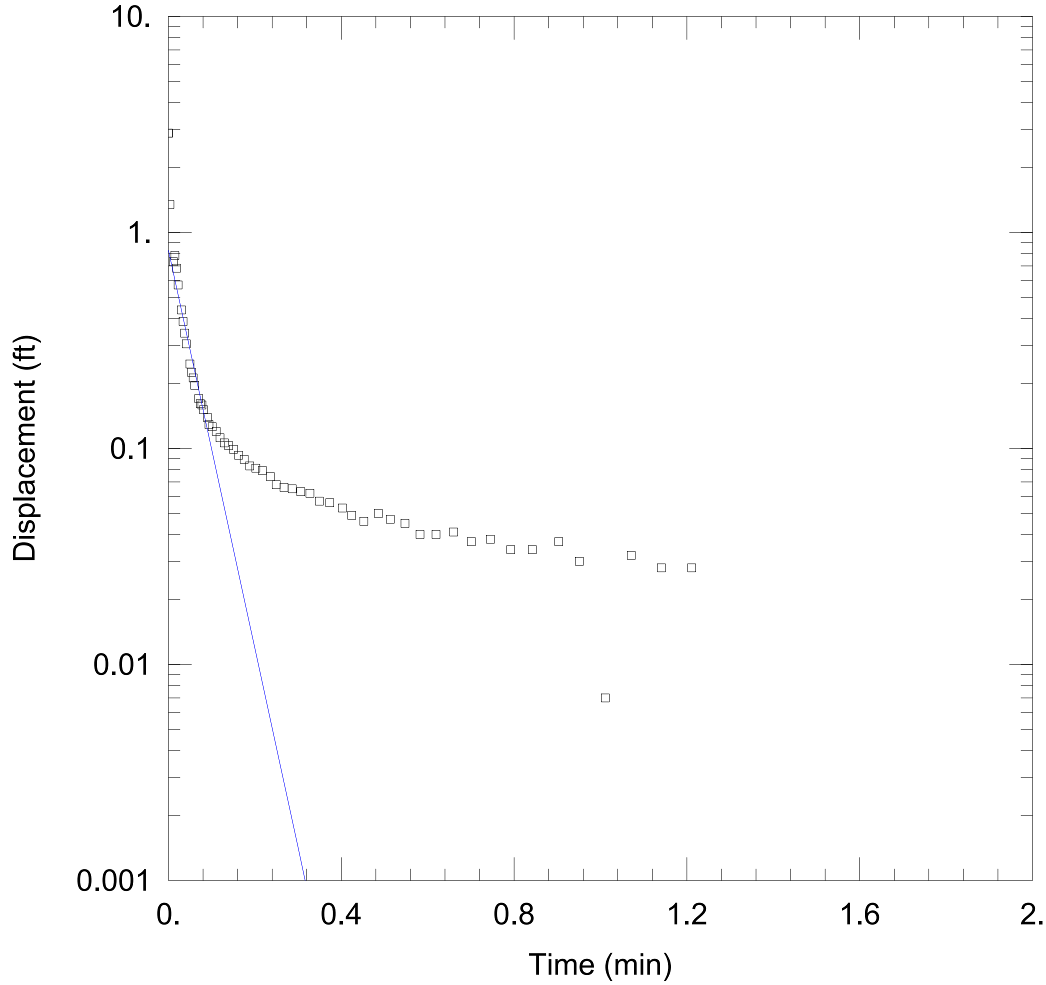
WELL DATA (MW-26)

Initial Displacement: 0.962 ft
Total Well Penetration Depth: 8.09 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 8.09 ft
Screen Length: 8.09 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 107.9 ft/day
y0 = 0.4616 ft



MW-26 RISING 3

Data Set: Q:\...\MW-26 Rising 3.aqt
Date: 08/24/17 Time: 11:37:26

PROJECT INFORMATION

Company: Wilcox
Client: O'Neal's
Project: 341.14
Location: Martinsville, IN
Test Well: MW-26
Test Date: 7/26/17

AQUIFER DATA

Saturated Thickness: 51.53 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-26)

Initial Displacement: 2.884 ft
Total Well Penetration Depth: 8.09 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 8.09 ft
Screen Length: 8.09 ft
Well Radius: 0.344 ft
Gravel Pack Porosity: 0.35

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 166.7 ft/day y0 = 0.8251 ft

APPENDIX K

Quality Assurance Project Plan

Indianapolis, IN
Ft. Wayne, IN
Evansville, IN
Cincinnati, OH

WILCOX™
ENVIRONMENTAL ENGINEERING

CORPORATE OFFICE
1552 Main Street, Suite 100
Speedway, IN 46224
phone 317.472.0999
www.wilcoxenv.com

Quality Assurance Project Plan

Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana
State Cleanup Site #0000402

Wilcox Project #341.14

October 31, 2018

Prepared for:
Mr. David L. Guevara, Ph.D.
Taft Stettinius & Hollister LLP
Indianapolis, Indiana

TABLE

FIGURES

ATTACHMENTS

1.0 PROJECT SUMMARY

1.1 Introduction

Wilcox Environmental Engineering, Inc. ("Wilcox") has prepared this Quality Assurance Project Plan ("QAPP") for investigation, sampling and remedial activities for the former O'Neal's Clothes Depot Cleaners facility located at 833 East Morgan Street, Martinsville, Indiana (the "Site"), shown in **Figure 1**. This QAPP was prepared to accompany the Remediation Work Plan ("RWP") designed to manage potential exposure risk to receptors.

This QAPP summarizes the policies, organization, objectives, quality assurance ("QA"), and quality control ("QC") activities designed to achieve the specific data quality objectives ("DQOs") associated with the investigation, sampling and remediation. The development of this plan was guided by: (1) the Indiana Department of Environmental Management's ("IDEM") *Remediation Closure Guide* ("RCG"), March 22, 2012 and as amended; (2) the United States Environmental Protection Agency ("USEPA") *Guidance on Systematic Planning Using the Data Quality Objectives Process (February 2006, QA/G-4)*, and (3) the USEPA *Requirements for Quality Assurance Project Plans (March 2001, QA/R-5).*

1.2 Project Description

1.2.1 Site Background

Soil and groundwater at the site have been impacted by chlorinated solvents and their degradation products including tetrachloroethene ("PCE"), trichloroethylene ("TCE"), cis-1,2-dichloroethylene ("DCE"), trans-1,2-dichloroethylene ("tDCE"), and vinyl chloride ("VC"). The one-story Site building is located in the central portion of the property with a storage shed located in the south portion of the site and an unnamed alley running west-east along the southern edge of the property.

A Sampling and Analysis Plan ("SAP") is included in **Attachment 1**. The Health and Safety Plan ("HASP") to be followed during Site activities is included in **Attachment 2**.

1.2.2 Project Objective and Scope

As noted above, the Site will be remediated under the management of IDEM's State Cleanup Program. The objective of the project is to investigate with a scope sufficient to complete the conceptual site model ("CSM"), implement contaminant remediation, and monitor Site conditions in order to demonstrate remedial progress and completion.

1.2.3 Sample Objectives, Rationale, and Locations

Sampling objectives, rationale, and locations are discussed in Sections 2.0 and 3.0 of the SAP in **Attachment 1**.

1.2.4 Parameters to be Tested and Frequency

The contaminants of concern ("COCs") for the Site are volatile organic compounds ("VOCs"). Laboratory analytical methods for the COCs are as follows:

Medium	Analytical Method
Water	SW-846 8260C
Soil	SW-846 8260C, 5035A
Vapor	TO-15, TO-17

Laboratory analyses will be performed by Pace Analytical Services, Inc. ("Pace") in Indianapolis, Indiana and Minneapolis, Minnesota. **Tables 1** through **4** of the SAP in **Attachment 1** list the COCs, analytical methods, (practical) reporting limits, method detection limits, laboratory control sample limits, matrix spike / matrix spike duplicate limits, and maximum relative percent differences for volatiles in water, soil, and vapor, respectively.

Field data that will be collected include the following:

- Qualitative and semiquantitative photoionization detector ("PID") screening data of total VOC concentrations in soil;
- Qualitative lithological descriptions of the soil samples;
- Static water levels and free product thicknesses (if present) in monitoring wells; and
- Selected water chemistry parameters in purged groundwater.

Investigations for advancement of soil borings, installation of groundwater monitoring wells, and installation of sub-slab soil gas sampling points will occur as needed. Groundwater and vapor monitoring is anticipated on a routine basis, such as quarterly, semiannually, and/or annually, depending upon medium and stage of Site remediation and/or monitoring.

1.2.5 Intended Data Usage

The data uses for the analyses conducted during the field investigations include the following:

- Field soil classification information to identify subsurface soil;
- Groundwater measurements in monitoring wells to determine the potentiometric surface;
- Free-phase liquid measurements in monitoring wells to determine the extent and thickness, if present;
- PID data from screening of soil samples to select sampling intervals;
- Groundwater qualitative descriptions and field measurements for low-flow (micro-purge) sampling to assess groundwater stability prior to sample collection;

- Helium concentrations for leak-testing sub-slab sampling ports and Summa canister assemblies; and
- Laboratory analysis of soil, groundwater, and vapor to identify the concentration and extent of any COCs, determine the need for additional investigations or remediation activities, and monitor Site progress to closure.

1.3 Quality Objectives and Criteria for Measurement Data

1.3.1 Data Quality Objectives

To achieve the project objectives, DQOs have been established to achieve data of sufficient quality for their intended uses. The DQOs for the investigation are based on the EPA *Guidance on Systematic Planning Using the Data Quality Objectives Process (February 2006*). The DQOs are included in **Table 1**.

1.3.2 Criteria for Measurement Data

The overall QA objectives are to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, field measurement, and reporting that will provide data that are scientifically valid, meet the DQOs, and are to a degree of quality consistent with their intended use. This section defines the goals for the QC effort and the accuracy, precision, sensitivity, completeness, representativeness, and comparability of laboratory analyses.

1.3.2.1 Definitions

The following definitions are based on the RCG, EPA's *Guidance for Quality Assurance Project Plans*, December 2002, EPA/240/R-02/009 and EPA's *Data Quality Objectives for Remedial Response Activities*, March 1987, EPA/540/G-87-003.

- Accuracy is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic measurement error (bias) and random error. Laboratories assess the overall accuracy of their instruments and analysis methods (independent of sample or matrix effects) through the measurement of "standards," which are materials of accepted reference values. Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy can be measured and expressed in terms of the recovery of surrogate compounds or recovery of spiked compounds. This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds.
- Precision is the agreement among a set of replicate measurements without consideration of the "true" or accurate value, *i.e.*, variability between measurements of the same material for the same analyte. Field collection procedures can be evaluated based on the precision of field duplicate samples. Sample matrices can be evaluated based on the precision of matrix spike duplicates.

- Completeness is defined as the percentage of measurements made that are judged to be valid measurements.
- Representativeness expresses the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, process condition, or an environmental condition. Representativeness is a qualitative parameter, which is dependent upon the proper design of the sampling program and the laboratory QC protocol.
- Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units.

1.3.2.2 Level of QC Efforts

The level of QC effort for the field sampling is described in Section 5.0 of the SAP, and will include the following types of QC samples:

- Field duplicate samples – to provide an estimate of the reproducibility of measurements, sampling procedures, and analytical procedures;
- Matrix spike/matrix spike duplicate (“MS/MSD”) samples – to provide information about the effect of the sample matrix on digestion and measurement methodology;
- Equipment rinsate blanks – to determine the effectiveness of the decontamination procedure if non-dedicated equipment is used during sampling; and
- Trip blanks – to assess the potential for VOC contamination of samples as a result of contaminant migration during sample shipment and storage.

The analytical laboratory will follow the QC requirements of the analytical methods in accordance with the requirements in the method and the lab’s QA manuals, included as **Attachments 3** and **4**. The laboratory’s reporting limits (“RLs”), method detection limits (“MDLs”), laboratory control sample (“LCS”) limits, MS/MSD limits, and relative percent difference (“RPD”) limits are in **Tables 1** through **4** in the SAP.

The level of QC effort for the field and laboratory measurements is described in Section 1.3.2.3. Calibration will be performed as indicated in Section 2.8.

1.3.2.3 Accuracy, Precision, and Sensitivity of Analysis

The QA objectives of field analyses with respect to accuracy, precision, and sensitivity are to obtain acceptable data based on specified performance criteria.

The water quality meter accuracy will be verified via calibration. The meter will be a Horiba U52 (or similar) rented on approximately weekly and calibrated by the vendor before each rental. Specifications for the U52 are as follows:

Specifications for the Horiba are as follows:

	Range	Resolution	Accuracy
Dissolved Oxygen mg/L	0 to 50 mg/L	0.01 mg/L	0 to 20 mg/L: ± 0.2 mg/L 20 to 50 mg/L: ± 0.5 mg/L
Conductivity	0 to 100 mS/cm	0.001 to 0.1 mS/cm (range dependent)	±1% F.S. (Median of two-point calibration)
Temperature 6560 Sensor	-10 to +55°C	0.01°C	±0.3 + 0.005 / 1°C
pH 6561 Sensor	0 to 14 units	0.01 unit	±0.1 unit
ORP	-2000 to +2000 mV	1 mV	±15 mV
Turbidity	0 to 800 NTU	0.1 NTU	±5% or ±1 NTU, whichever is greater

The accuracy of the PID for soil screening will be evaluated by daily pre-measurement calibration with a standard reference gas such as isobutylene. The PID will be an IonScience PhoCheck Tiger or Photovac 2020 ProPlus, or similar. Specifications of the instruments are as follows:

	Range	Resolution	Accuracy
IonScience ProCheck Tiger	1 ppb to 20,000 ppm	1 ppb	± 5% display reading ± one digit
Photovac 2020 ProPlus	0.1 ppm	0.1 – 10,000 ppm	± 10% or ± 2 ppm, whichever is greater

The helium meter for sub-slab sample port / Summa canister assembly leak checks will be rented prior to each use and will be calibrated by the vendor prior to each rental.

The accuracy, sensitivity, and precision requirements of the respective analytical methods are as indicated in the lab's QA manuals. **Attachments 3** and **4** contain the QA manuals for the Pace Indianapolis and Minneapolis laboratories, respectively. Indianapolis will analyze soil and groundwater samples, and Minneapolis will analyze vapor samples.

The acceptance criteria for percent relative difference (see Section 4.3.2.1) of laboratory analytical data for field duplicates will be 50% and 100% for groundwater and soil samples, respectively.

1.3.2.4 Data Completeness, Representativeness, and Comparability

Field activities are expected to generate a completeness of at least 90% of the planned samples. It is expected that the laboratory will provide data meeting the QC acceptance criteria for at least 95% of the samples analyzed. The completeness of an analysis will be documented by the laboratory with items such as QC data to allow the data user to assess the quality of the results.

Appropriate selection of the sampling locations and use of standard investigation, measurement, analysis, and QA/QC procedures as described in this QAPP will be used to achieve representativeness of the data.

Data comparability will be achieved by conducting the monitoring, screening, sampling, and analysis in a similar manner at each investigation/monitoring point.

1.4 Project Organization and Schedule

1.4.1 Project Organization

This section presents the operational responsibilities involving the execution and direct management of the technical and administrative aspects of this project.

1.4.1.1 General Project Management

Wilcox will be responsible for the execution of the work to evaluate potential contamination in the areas investigated, and for issuing project deliverables. The operational responsibilities involving the execution and direct management of the technical and administrative aspects of this project are summarized below.

General Project Approval: **Taft Stettinius & Hollister LLP**
Mr. David L. Guevara, Ph.D. will approve the activities performed at the Site and the strategies and activities required to complete the project.

Overall Management of the Investigation Activities: **Wilcox**

- Project Director/Principal-in-Charge – Mr. R. Scott Stoldt, CPG, LPG, PG
- Project Manager – Mr. Jeremy Kinman, LPG, PG
- Project Engineer – Mr. Craig Eckerly, LPG
- Project Soil Scientist or Geologist – Mr. John Laatsch, RSS, Mr. Oliver Purcell and/or Mr. Jake Price

The Project Director/Principal-in-Charge has the overall responsibility for the project meeting the requirements of Taft Stettinius & Hollister LLP and IDEM's guidelines and requests.

The Project Manager will establish budgets, schedules, staffing, and quality objectives; be responsible for the overall execution of the investigation/sampling in accordance with the QAPP; and be responsible for the preparation of deliverables.

The Project Engineer will serve as the Quality Assurance Officer ("QAO"). The QAO or designated qualified alternate whose designated work is under the supervision of the QAO, is responsible for auditing the implementation of the QA program in conformance with the demands of specific investigations/monitoring.

The Project Soil Scientist or Geologist will oversee the day-to-day field activities and may direct the work of sampling technicians for groundwater or vapor sampling.

1.4.1.2 Field Activities

Wilcox will self-perform or supervise subcontracted investigation activities. Specific individuals involved in the field activities will include the following:

- Site Coordinator – Project Soil Scientist or Geologist.
- Field and Data Analysis Support – Project Soil Scientist or Geologist or designated qualified alternate.
- Health and Safety Officer – Wilcox's Certified Industrial Hygienist or designated qualified alternate.

Subcontractors may be employed by Wilcox to provide professional services in completion of the field activities, including laboratory analysis, private utility locating, soil boring, injections, and monitoring well installation, and surveying. Subcontractors will be required to provide appropriate project management and qualified personnel.

1.4.1.3 QA Organization

Wilcox's Project Manager and Principal-in-Charge are responsible for the overall quality of project deliverables. The QAO will provide overall QA of the project's field activities. Specific functions and duties include:

- Review QA plans and procedures;
- Provide QA technical assistance to project staff;
- Review the field data acquired during the field activities for collection in accordance with the QAPP;
- Review laboratory analytical data for generation in accordance with the QAPP; and
- Review project documentation for compliance with the QAPP.

The laboratory's QAO will be responsible for enforcing and documenting the QA/QC procedures performed during the analytical work in accordance with the QA Manuals in **Attachments 3** and **4**.

1.4.2 Project Schedule

New investigations will proceed on a schedule as needed based on the completeness of the conceptual site model with each subsequent investigation. Routine groundwater and vapor monitoring will proceed on schedules such as quarterly, semiannually, and/or annually.

1.5 Documentation and Records

Field data documentation will be provided to the QAO for review. This will include such items as the groundwater monitoring forms, chains of custody, soil gas and indoor air sampling data sheets, sub-slab sampling leak test data forms, indoor air building survey forms, and copies of the field notebooks.

The laboratory documentation system will comply with the requirements of the analytical protocols, as appropriate, and with the laboratory's QA manuals included in **Attachments 3** and **4**. Level IV data packages are requested by IDEM for initial investigation and Site closure samples and will be requested of the laboratory for these sample collection events. Data packages for routine sampling will be reported at Level II.

A list of the documents to be kept in the Wilcox project file is presented in Section 2.4.

1.6 Special Training Requirements and Certification

Samples will be collected by experienced geologists, soil scientist, or sampling technicians. Subcontractors will be experienced in the work they will be performing and certified as applicable. Deliverables submitted to IDEM will be reviewed and approved by a Licensed Professional Geologist, Professional Engineer, Registered Soil Scientist, or Certified Hazardous Materials Manager.

2.0 MEASUREMENT AND DATA ACQUISITION

2.1 Sampling Locations

The sample location selection methods are described in section 3.0 of the SAP.

2.2 Sampling Methods

Sampling equipment and procedures are described in section 5.0 of the SAP and a summary table of the sample containers, preservation techniques, and holding times is included in **Table 5** of the SAP.

2.3 Sample Handling and Custody Requirements

A sample will be considered under a person's custody if it is: (1) in a person's physical possession, (2) in view of the person after he or she has taken possession, (3) secured by that person so that no one can tamper with the sample, or (4) secured by that person in an area that is restricted to authorized personnel. The sample packaging and shipment procedures summarized below will aid in the samples arriving at the laboratory with the chain-of-custody intact.

2.3.1 Field-Specific Custody Procedures

2.3.1.1 Initiation of Chain of Custody Field Procedures

The field sampler will be responsible for the care and custody of the samples until they are transferred or properly dispatched. As few personnel as possible will handle the samples.

After placing the sample into an appropriate container, the field sampler will affix properly completed sample labels. Samples will be identified with labels that are securely attached to the sample containers. Each label will present the following information:

- Unique sample identification, as specified in Section 4.0 of the SAP;
- Date and time of collection;
- Requested analysis; and
- Preservatives used, if applicable.

2.3.1.2 Field Notebooks and Documentation

- When documenting field activities:

- Field notebook entries will describe the data- and sample-collection activities performed with sufficient detail that persons going to the Site could reconstruct a particular situation from the notes without reliance on memory.

- Bound field notebooks will be used for the soil and vapor sampling performed at the Site. Notebooks will be assigned to the project and stored in a secure location when not in use. Each notebook will be permanently labeled with the Site name, Wilcox project number, and notebook number. For that data for which forms are included in the SAP, the forms may be used in place of data entry in the field book.

- The title page of each notebook will contain the following:
  - Notebook number,
  - Project name and number,
  - Project Site address and Site contact telephone number,
  - Emergency telephone numbers,
  - Project start date, and
  - Project end date, if available.

- At the beginning of each entry, the date, start time, weather, names and company of all field personnel present, level of personal protection being used, and the signature of the person making the entry will be recorded.

- The names of visitors to the Site and the purpose of their visit will be entered in the field notebook.

- Measurements made and samples collected (*e.g.*, PID measurements, vapor samples, and soil descriptions) will be recorded, including the instrument used and calibration performed. Duplicate field measurements will also be entered in the notebook.

- Whenever a sample is collected or a measurement is made, the sample number/location will be recorded. The number of the photographs taken, if any, will also be noted.

- The equipment used to collect samples will be noted, along with the time of sampling; sample number and physical description; depth at which the sample was collected; whether the sample is a grab or a composite (and if composited, how it was composited); volume and number of sample containers; preservation; type of sample (investigative, duplicate, trip blank, etc); the unique sample number corresponding to each duplicate; deviations from QAPP procedures; and requested analyses. If field screening indicates that a sample has potentially high concentrations, the lab will be notified of the possibility via a note on the chain of custody form that includes that sample.

- Soil sample information will be included on the boring log (included as Attachment 1 of the SAP). Sample designation procedures are described in Section 4.0 of the SAPs.

- Deviations from the sample collection/handling procedures provided in the SAP will be recorded in the field notebook, along with appropriate explanations.

- If photos of the Site or the sample locations are taken, a photo log will be entered with the photo number, a description of the cardinal direction of the photo, and a description of what was photographed.

- Entries will be printed with waterproof indelible ink and no erasures made. If an incorrect entry is made, the information will be crossed out with a single strike mark so that it remains legible; the error must then be initialed by the responsible individual and the date of the change noted. The correction must be written adjacent to the error. No pages, even if mutilated or illegible, will be removed from the notebook.

2.3.1.3 Transfer of Custody and Shipment Procedures

To provide documentation necessary to trace sample possession from the time of collection to the time of receipt by the analytical laboratory, a chain-of-custody ("COC") form will be completed and will accompany each shipment of samples to the laboratory. The following sample packaging and shipment procedures will be used:

- Samples will be accompanied by a completed COC form. The sample numbers and locations will be listed on the COC form. When transferring the possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the COC form. This record documents the transfer of custody of samples from the sampler to another person or to a laboratory.
- The field portion of the custody documentation will include the project name, the sample number, date and time of collection of each sample, whether the sample is grab or composite, number of containers, preservation used, and analyses requested.
- Samples will be packaged for shipment, if necessary, and dispatched to the appropriate laboratory for analysis, with a separate signed COC form enclosed in each sample box or cooler. Shipping containers will be secured with tape and custody seals for shipment to the laboratory.
- An airbill from the overnight carrier will be used for shipment. Receipts from the airbill will be retained as part of the custody documentation. Commercial carriers are not required to sign off on the COC forms as long as the COC forms are sealed inside the sample coolers and the custody seals remain intact.
- If samples are handed off to a courier, the sample cooler/container will either be packaged as if for shipment with the COC form inside and custody seals outside the tape-sealed cooler, or the container will be relinquished to the courier as documented by signatures on the COC form by the person relinquishing and the person receiving.

Further description of the sample preparation, handling, and shipment procedures are presented in Section 6.1 of the SAP.

2.3.2 Laboratory Chain of Custody Procedures

The chain-of-custody procedures to be followed by the laboratory are in the laboratory's QA manuals in **Attachments 3** and **4**.

2.4 Project File Custody Procedures

Wilcox will maintain the project file for the Site sampling activities. The Project Manager will also serve as the project file custodian. The contents of the project file will be kept in a dedicated file that will have controlled access.

The project file will contain originals or paper or electronic copies of project-related documents. Paper or electronic media may include the following, as applicable:

- The QAPP;
- Progress reports, addendum documents to project plans, investigation reports, and remediation plans and reports;
- Completed field notebooks, field data forms, pictures, boring logs, and well construction logs;
- Laboratory analytical results, including case narratives, summary data sheets, and QC data summaries;
- Laboratory raw data and instrument outputs for Level IV data packages;
- Subcontractor reports, as applicable;
- Completed sample custody documentation such COC forms and air bills, as applicable;
- Project-related communications; and
- Other project-related documentation.

2.5 Analytical Methods

The samples will be analyzed in a manner consistent with the laboratory's QA manuals in **Attachments 3** and **4**. The analytical methods, reporting limits, method detection limits, laboratory control sample limits, MS/MSD limits, and maximum relative percent differences for each method and analyte are in **Tables 1** through **4** of the SAP.

2.6 Quality Assurance / Quality Control Requirements

In addition to the QA/QC requirements described in Section 5.0 of the SAP and Section 1.3 of this QAPP, a review of the QA/QC procedures will be performed periodically, as described in the next sections for field and laboratory procedures.

2.6.1 Field Sampling

The Site Coordinator will perform field QC during field activities. Field QC procedures, including instrument calibration checks as applicable and the collection of QC samples, will be carried out according to the QAPP and documented in a field notebook.

The Site Coordinator or designee will maintain the field notebook. The following QC procedures will be reviewed by the Site Coordinator and documented in the notebook:

- Sample collection in accordance with the sampling procedures;
- Decontamination of sampling equipment;

- Field measurement procedures and QC checks;
- Collection of QC samples;
- Preventive maintenance of field instruments as applicable; and
- Calibration of field instruments as applicable.

The sample collection procedures for the investigative and QC samples will be compared to the detailed procedures outlined in the SAPs. Corrective actions taken, such as instructions to a sampling team member on whether to alter the sample collection or decontamination procedures, will be recorded in the field notebook by the Site Coordinator or a sampling team member.

Decontamination procedures will be observed and corrective actions will be recorded in the field notebook. The calibration procedure and sequence for the instrument will be verified by the Site Coordinator and documented in the field notebook.

2.6.2 Laboratory Analysis

The laboratory will perform the internal QC checks specified in the analytical methods it is following. Depending on the analytical method, the QC checks may include analyzing sample spikes, surrogate spikes, reference samples, laboratory control samples, storage blanks, and/or method blanks. The frequency of QC checks, the compounds to be used for spikes, and the QC acceptance criteria are described, as appropriate, in the analytical methods to be used and in the QA manuals included as Attachments 3 and 4.

The laboratory will document internally that both initial and ongoing instrument and analytical QC criteria have been met. Level IV data packages will also contain raw data for both the QC checks and the samples.

2.7 Instrument and Equipment Testing, Inspection, and Maintenance Requirements

Routine preventive maintenance will be the responsibility of the individual with direct oversight of the equipment: Wilcox for field monitoring/sampling equipment, subcontractors for subcontractor-owned equipment such as drill rigs, and the laboratory for laboratory equipment.

2.7.1 Field Instruments/Equipment

Preventive maintenance procedures for the water quality meter, PID, and product/water interface probe will be performed in accordance with the guidelines outlined in their respective operating manuals or as otherwise recommended to Wilcox by the manufacturer(s). In addition, field equipment will be decontaminated at the beginning of each day and between samples or borings to help ensure proper performance. Equipment maintenance will be recorded in the field notebook.

2.7.2 Laboratory Instruments

The preventive maintenance procedures for laboratory equipment will be the responsibility of the laboratory, and will be performed in accordance with the manufacturer's instructions and/or the requirements in the appropriate analytical method or QA Manuals in Attachments 3 and 4.

2.8 Instrument Calibration and Frequency

This section presents the calibration procedures and information for major measurement systems, including field and analytical laboratory testing systems.

2.8.1 Field Instruments and Equipment

A calibration program will be maintained and administered by the Site Coordinator for field instruments that will require calibration during their use on the project or during a particular mobilization. Information about calibrations performed in the field will be documented in the field notebook. The SAP describes the field instruments used for sampling different media.

Field personnel will be familiar with the calibration, operation, and maintenance of field instruments and will maintain their proficiency. Operating procedures outlined in the manual for each instrument will be followed. If field equipment should fail, the Site Coordinator will be contacted immediately and will either provide replacement equipment or have the malfunction repaired immediately.

2.8.2 Laboratory Instruments

The laboratory will be responsible for the calibration of its analytical equipment used for laboratory analyses of soil, groundwater, and/or air samples. The calibration procedures to be followed by the laboratory are presented in the QA manuals included in **Attachments 3** and **4**.

2.9 Inspection and Acceptance Requirements

Supplies and consumables (such as calibration gases, sample tubing, and sample containers) will be obtained from reliable suppliers or the laboratory and stored appropriately so they will not affect the quality of the data collected.

2.10 Data Management Plan

2.10.1 Documentation Procedures

Procedures to document the field activities are described in Section 2.3.1.2. Field notebooks and laboratory data will be kept in a secure location in Wilcox's office in accordance with Section 2.4.

2.10.2 Data Reduction

The laboratory will perform data reduction for the analyses it performs. The procedures to be followed by the laboratory are included in **Attachments 3** and **4**. Reduction of the laboratory data will help ensure that the actual quantities reported are accurate and appropriately qualified. The field data do not require reduction.

Wilcox will reduce the laboratory data into tables and figures, as appropriate. The reported quantities will be as detected, qualified or not, by the laboratory. Compounds detected in blanks will not be subtracted from the analytical results of investigative samples and will be reported separately.

Field and analytical data will be summarized in the reports, as applicable, as follows:

- Geological field observations will be presented in soil boring logs;
- PID readings will be summarized in the soil boring logs;
- Depth to water and to free-phase liquid, if detected, will be presented in tables;
- Laboratory data will be summarized in tables and figures; and
- Laboratory reports will be included in appendices (paper or electronic).

Data summary documents (i.e., boring logs, tables, and figures) will be checked for accuracy after completion. The analytical data tables will contain the sample name, sampling location, sampling date, sample reporting limits for non-detected compounds, detected analytical results, and any qualifiers assigned by the laboratory or by Wilcox. The data presented in figures will vary depending on the results. Figures such as groundwater potentiometric surface maps, cross sections, and/or figures with the lateral or vertical extent of contamination will be prepared as necessary to aid in understanding the data collected.

2.10.3 Reports

Reports will be compiled as indicated in Section 7.0 of the SAP. Reports will be reviewed by the Project Manager and Project Director/Principal-In-Charge before submittal to verify the data and information presented are correct and conclusions are based on sound technical principles.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessments and Response Actions

3.1.1 Performance and Systems Audits

The Wilcox Project Manager will monitor and audit the performance of QA/QC procedures to evaluate whether sample collection is executed in accordance with this QAPP and if corrections are needed.

3.1.1.1 Internal Audits of Field Activity

Wilcox's Site Coordinator will perform QA audits of field measurement, sample collection, sample custody, documentation, and decontamination procedures to evaluate compliance with the requirements in this QAPP.

3.1.1.2 Internal Laboratory Audits

The laboratory's QAO will perform internal performance and system audits of laboratory operations in accordance with the laboratory's QA manuals in **Attachments 3** and **4**. The laboratory will notify Wilcox's Project Manager or QAO of findings that require corrective actions that cannot be applied at the laboratory (e.g., re-sampling), as indicated in Section 3.1.2.3.

3.1.1.3 External Field Audits

At this time, no external field audits are planned for the investigative sampling. If conducted, external field audits may include a review of the same procedures included in the internal audits (Section 3.1.1.1). External field audits would be performed by personnel who meet the requirements of the approved HASP.

3.1.1.4 External Laboratory Audits

At this time, no external laboratory audits are planned for the sample analyses. If conducted, external laboratory audits may include a review of the laboratory's adherence to its QA Manual in performing the sample analyses.

3.1.2 Corrective Actions

3.1.2.1 Sample Collection and Field Measurements

If a problem occurs in the field that is immediately correctable by direct action, Wilcox's Site Coordinator will be responsible for ensuring that the action is taken. For example, if poor sampling techniques are observed in the collection of a sample, the sample will be recollected under the supervision of the Site Coordinator, and steps will be taken to prevent a reoccurrence of the problem. Problems and corrective actions will be documented on a Corrective Action Form (**Figure 2**).

3.1.2.2 Laboratory Analyses

The department supervisor will evaluate problems that may occur during analysis that are immediately correctable (i.e. would not require additional field work to correct) and will enlist the laboratory's QAO to solve. Corrective action procedures of the laboratory are presented in the QA Manuals included in **Attachments 3** and **4**.

3.1.2.3 Other Corrective Action

Problems such as determining that insufficient sample volume is available at the laboratory for analysis are not immediately correctable. If such a problem is encountered, the laboratory Project Manager will contact Wilcox's Project Manager to determine the corrective action warranted. Wilcox's Project Manager will be responsible for implementing the agreed-to action. This same procedure will be followed if audit results or detection of unacceptable data indicate that re-sampling is necessary.

If there is a problem with laboratory performance that is not immediately correctable, the proposed corrective action will be discussed in a proposal by the laboratory's QAO. The corrective action will be implemented only after full agreement on the required action has been reached. The laboratory Project Manager will be responsible for implementing any corrective actions under his/her control.

3.2 Reports to Management

The investigation reports submitted to IDEM (described in Section 7.0 of the SAPs) will include the laboratory data packages, which will contain the individual QC sample results in individual pages and the results of any required corrective action in a narrative section.

4.0 DATA VALIDATION AND USABILITY

4.1 Data Review, Validation, and Reporting

This section presents the responsibilities and procedures for reducing field and analytical data, reviewing and validating analytical data, and reporting the results of field investigations and confirmation sampling performed at the Site.

4.1.1 Data Review

Data review will be performed as indicated in Section 4.2. The Wilcox QAO or designee(s) will be responsible for reviewing sample collection procedures and laboratory reports to evaluate whether the field and laboratory QA/QC requirements established in this QAPP have been met.

4.1.2 Data Validation

Laboratory data will be validated as described in Section 4.2.

Field data will not be validated beyond the field checks done before collecting a measurement, because these data will be used in a relative, semi-quantitative sense.

4.1.3 Data Reporting

Each laboratory and contractor is responsible for reporting the data generated to Wilcox. Wilcox is responsible for reporting data generated for Taft Stettinius & Hollister LLP and IDEM.

The data collected during the field portion of the work will be submitted in the form of tables, figures, or attachments in the field investigation reports, as further detailed in Section 7.0 of the SAP.

4.2 Validation and Verification Methods

4.2.1 Data Validation

The laboratory will perform in-house analytical data validation under the direction of the laboratory QAO. The laboratory’s validation will include identifying and flagging the laboratory QC outliers in accordance with the specific analytical method used for the analysis. Depending on the analytical method, QC checks will include spiked addition recoveries, surrogate recoveries, laboratory duplicate percent relative differences, established quantitation limits, and any other QC check required by the analytical method used. The laboratory QAO will also check that proper calibration procedures were followed during the analyses and that data were properly reduced in accordance with the analytical methods used.

4.2.2 Data Verification

The laboratory procedures for data verification are included in the QA Manuals in **Attachments 3** and **4**.

Wilcox’s QAO will evaluate for the following after receipt of the laboratory data:

- Deviations from the sample collection procedures and the reasons for and effects of the deviations;
- If the samples were analyzed for the correct parameter(s) using the requested analytical method(s). If not, a discussion of the effects on the project objectives will be presented;
- If the field QC samples were collected as indicated in the SAP, and the potential effect of deviations on the quality of the data;
- If laboratory QC sample results affect the quality of the data; and
- Deviations of the field instrument calibration procedures and frequency and their potential effects on the quality of the data.

4.3 Reconciliation with Data Quality Objectives

The purpose of the data assessment steps described in the next subsections is to evaluate if the project-required QC objectives listed in Section 1.3 have been met by the set of laboratory data that was generated. Data assessment will be conducted by the Wilcox QAO or designee(s). The QAO is responsible for assessing the precision, accuracy, and completeness of the analytical data. Project data sensitivity, representativeness, and comparability will also be evaluated.

4.3.1 Field Measurement Data

Field data will be assessed through a review of the field results for compliance with the QC criteria specified in this QAPP. Instrument calibration and calibration checks, as applicable, will be used to assess the accuracy of the field measurements. Precision will be assessed on the basis of reproducibility by duplicate readings of a single sample or standard. Data completeness will be calculated based on the number of samples collected by using Equation 4-1:

$$\%\ \text{Completeness} = \frac{\text{Valid Data Obtained}}{\text{Total Data Planned}} \times 100 \qquad \text{[Equation 4-1]}$$

4.3.2 Laboratory Data

Laboratory results will be assessed for precision, accuracy, sensitivity, and completeness as described in the following subsections. The laboratory data packages will provide the relative percent difference (“%RPD”) and percent recovery (“%R”) information required for each analysis in accordance with the analytical methods performed and whether they were exceeded.

4.3.2.1 Precision

The precision of laboratory analyses is assessed by comparing the analytical results of investigative samples and duplicates. The %RPD will be calculated for each pair of duplicate and investigative sample analyses by using Equation 4-2.

$$\%RPD = \frac{S - D}{(S + D)/2} \times 100 \qquad \text{[Equation 4-2]}$$

Where:

S = First sample value (original, MS, or LCS value), and

D = Second sample value (duplicate, MSD, or LCSD value).

The analytical results of field duplicates will be evaluated as part of the data validation process described in Section 4.2.1.

4.3.2.2 Accuracy

The accuracy of the laboratory results will be assessed for compliance with the established QC criteria described in the corresponding analytical method by using the analytical results of method blanks, reagent/preparation blanks, and MS/MSD and LCS/LCSD samples. The %R of MS, MSD, LCS, or LCSD samples will be calculated by using Equation 4-3.

$$\%R = \frac{A - B}{C} \times 100 \qquad \text{[Equation 4-3]}$$

Where:

A = Analyte concentration determined experimentally from the spiked sample,

B = Background level determined by a separate analysis of the unspiked sample, and

C = Amount of the spike added.

4.3.2.3 Completeness

The data completeness of laboratory analytical results will be assessed for compliance with the established QC limit. The completeness is calculated using Equation 4-1.

4.3.2.4 Sensitivity, Representativeness, and Comparability

The achievement of Reporting Limits depends on the instrument's sensitivity and sample matrix effects. Therefore, it is important to monitor the instrument's sensitivity to ensure the data quality through appropriate instrument performance. The instrument's sensitivity will be monitored through the analysis of method blanks, calibration check samples, and laboratory control samples.

Representativeness and comparability will be assessed through an evaluation of whether the investigation procedures followed the requirements of this QAPP.

TABLE

Table 1: Data Quality Objectives

Table 1: Data Quality Objectives for Soil and Groundwater Sampling
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Step		Description
1	State the Problem	The site historically operated as a drycleaning facility and chlorinated solvent compounds have been detected in the subsurface.
2	Identify the Decision	Determine if the concentrations of constituents of concern (COCs) consisting of volatile organic compounds, and more specifically, chlorinated hydrocarbons, exceed the remedial objectives.
3	Identify Inputs to the Decision	Evaluate COCs using analytical methods including SW-846 Method 8260C for groundwater and soil, Method 5035A for soil and Methods TO-15 and TO-17 for vapor.
4	Define the Boundaries	The spatial boundaries of the investigation area consist generally of alleyway east of N. Colfax St. to the east, Jackson Street to the south, S. Jefferson St. to the west, and E. Morgan St. to the north.
5	Develop a Decision Rule	If the COCs are above the relevant remedial objectives considering the conceptual site model, then the remedation actions described in the Remediation Work Plan will be implemented, and routine monitoring will be conducted to evaluate progress.
6	Specify Limits on Decision Errors	Data will be evaluated relative to the remedial objectives. For locations or areas above the remedial objective, an exposure point concentration may be calculated and then compared to the remedial objectives.
7	Optimize the Design for Obtaining Data	Soil samples will be obtained from up to three distinct depth intervals in each boring. Groundwater samples will be obtained from each monitoring well in the currently-approved extent of the monitoring well network. When existing wells are sampled during routine monitoring, the gauging and sampling sequence will be based on an order of precedence from less-impacted wells to more-impacted wells. Subslab vapor sampling will be targeted to areas above or nearest known or suspected soil and/or groundwater contamination, and/or nearest sensitive receptors. Indoor air sampling will be targeted to areas with the greatest likelihood of highest exposure risk.

FIGURES

WILCOX PROJECT #
341.14

PROJECT MANAGER
J. KINMAN

FILE NO.
34114001

SCALE
1" = 80'

DATE
09/16/16

FIGURE NO.
1

SITE PLAN

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING

Figure 2. Corrective Action Form
Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana

Date: ______________________ Activity: ______________________

Problem/Question reported by: ______________________

Sample Number(s), if applicable: ______________________

Description of Problem: ______________________

Summary of Corrective Actions(s): ______________________

Is this a recurring problem? ______________________

Should the Standard Operating Procedure be modified or updated? ______________________

Approval of Lab or Field Project Manager or Quality Assurance Officer? ______________________

Distribution: (Check all that are appropriate)

Client Representative ______________________
Wilcox Operations Vice-President ______________________
Wilcox Technical Director ______________________
Wilcox Project Manager ______________________
Wilcox Quality Assurance Officer ______________________
Laboratory Project Manager ______________________
Laboratory Quality Assurance Officer ______________________
IDEM Project Manager ______________________

ATTACHMENT 1

Sampling and Analysis Plan

Sampling and Analysis Plan

Former O'Neal's Clothes Depot Cleaners
833 East Morgan Street
Martinsville, Indiana
State Cleanup #0000402
Wilcox Project #341.14

October 31, 2018

Prepared for:

Mr. David L. Guevara, Ph.D.
Taft Stettinius & Hollister LLP
Indianapolis, Indiana

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1.0 INTRODUCTION

Wilcox Environmental Engineering, Inc. (Wilcox) prepared this Sampling and Analysis Plan (“SAP”) for investigation and sampling activities at the former O’Neal’s Clothes Depot Cleaners facility located at 833 East Morgan Street, Martinsville, Indiana (the “Site”), as shown in Figure 1. This SAP was prepared as an appendix to the Remediation Work Plan (“RWP”) for the Site.

Soil and groundwater at the site has been impacted by chlorinated solvents and their degradation products including tetrachloroethene (“PCE”), trichloroethene (“TCE”), cis-1,2-dichloroethene (“DCE”), trans-1,2-dichloroethene (“tDCE”), and vinyl chloride (“VC”). The one-story Site building is located in the central portion of the approximately 0.2-acre parcel with a storage shed located in the south portion with an unnamed alley oriented west-east along the southern edge of the property.

2.0 SAMPLING OBJECTIVES AND RATIONALE

This SAP serves as a companion document to the RWP for the Site.

Wilcox prepared this SAP to present the sampling rationale and describe the sampling methods and equipment to be used during investigative and monitoring activities at the Site. Health and safety procedures related to the investigative activities are discussed in the Health and Safety Plan (HASP) included as an appendix to the Quality Assurance Project Plan (“QAPP”) also accompanying the RWP.

The development of this SAP was guided by the IDEM *Remediation Closure Guide* (“RCG”, March 22, 2012) and the Environmental Protection Agency (“EPA”) document *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (October 1988). Guidelines for the selection and definition of field methods, sampling procedures, and sample custody were based on guidelines in the EPA document *Compendium of Superfund Field Operations Methods* (December 1987) and other documents as referenced.

The constituents of concern (“COCs”) for the Site are volatile organic compounds (“VOCs”). **Tables 1** through **4** list the COCs, analytical methods, (practical) reporting limits, method detection limits, laboratory control sample limits, matrix spike / matrix spike duplicate limits, and maximum relative percent differences for COCs in water and soil, respectively. **Tables 1** through **4** also list the RCG screening levels for data comparison, including residential groundwater tap screening levels for groundwater.

3.0 SAMPLE LOCATIONS

Sample locations for soil and groundwater will be selected based on the results at previous investigation locations and areas where additional monitoring is needed.

4.0 SAMPLE DESIGNATION

Each sample container will be labeled with the following information:

- Name of site;

- A sample numbering system will be used to identify each investigative and quality control sample. The groundwater sampling locations will be identified by the monitoring well number (MW-01, etc.). Sample type will be identified by a code corresponding to the letter type. Sample types that could be used in this investigation include:

  - MW or SB – Soil Boring sample
  - MW – Groundwater sample
  - IA – Indoor Air
  - AA – Outdoor/ Ambient Air
  - SS – Sub-slab Soil Gas
  - DUP – Duplicate sample
  - EQB – Equipment Rinsate Blank sample
  - MS/MSD – Matrix Spike /Matrix Spike Duplicate sample

- Numeric Location identification numbers will follow the sample type (letter) code and will be assigned consecutively when new locations are installed and will begin where the last sample number left off. Monitoring wells will utilize a two-digit naming convention and soil borings will utilize a three-digit naming convention (e.g. MW-01, SB-001) when naming new locations. Indoor Air, Outdoor/Ambient Air, and Sub-Slab Soil Gas will utilize a two-digit naming convention (e.g. IA-01).

- Soil sample locations will include the depth interval [*e.g.* SB-011 0-2ft]. At locations where soil borings are completed as monitoring wells, soil sample locations will be identified with "MW" [*e.g.* MW-11 0-2ft];

- Groundwater samples will be labeled using the monitoring well number (*e.g.* MW-05);

- Duplicate samples will be indicated by "DUP" followed by a two-digit number designation that will allow for blind duplicate analyses. For example: "DUP 01" would be the first blind duplicate sample collected for a specific sampling event. The field book or field sampling form will indicate the sample from which the duplicate was collected;

- Equipment rinsate blanks will be indicated by "EQB" followed by a two-digit number designation;

- Matrix Spike/Matrix Spike Duplicates will be indicated by "MS/MSD" in parentheses following the well or boring number and sample depth range, if applicable;

- Date and time collected. For duplicates, only the date will be indicated; and,

- Analyses requested.

The information described above will be recorded on the sample label, in the field notebook, field forms, and laboratory chain-of-custody ("COC") for each sample, in accordance with the procedures indicated in Section 6.0 of the QAPP.

5.0 SAMPLING EQUIPMENT AND PROCEDURES

This section details the field procedures to be used at the Site during the investigation. Field measurements and observations will be recorded in a field notebook and/or on field data forms, as specified in Section 5.0 and 6.0 of the QAPP.

5.1 Soil Sampling

Investigative soil sampling activities will likely be completed using hand auger, direct-push drilling technology, and geotechnical and continuous core samplers. Other drilling technologies may be used if necessary. Soil samples will be collected continuously to total depth for:

- lithological characterization;
- VOC field screening using a photoionization detector ("PID") in order to document semi-quantitative organic vapor concentration in soil samples and aid in the targeting of soil sample collection for analysis; and
- laboratory analysis of selected intervals.

Soil sample cores two to four feet in length recovered from each boring will be described and logged using the Unified Soil Classification System ("USCS"). Wilcox field scientists will identify the two-letter USCS soil type abbreviation, the percent recovery, PID reading, and describe the color, plasticity, gradation or sorting, density or consistency, moisture, and toughness from visual observation and field screening activities. A Munsell® color chart may be used to identify the color of the soil. Boring logs will be reviewed by a licensed professional geologist. An example boring log is included in **Attachment A**.

Subsurface soil samples will be collected at each boring location from the interval exhibiting the greatest field indicators of contamination within the vadose zone.

Additional soil samples may be collected from the saturated zone, and possibly an interval immediately below apparent contamination, for the purpose of vertical delineation. Historical potentiometric data and soil boring logs collected at the Site will be used to aid in the determination of saturated zones in borings.

High clay content can result in slow groundwater recharge, and the groundwater surface may not be apparent in clayey soil cores, particularly if the clay remains moist from surface infiltration or within the smear zone. If clayey soil is encountered and if there are field indications of contamination, the soil boring will be advanced until the groundwater surface location is discernable, until a depth of 30 feet bgs is reached, or until contamination is no longer discernable, whichever occurs first; and the soil sample interval for delineating vertical extent of soil contamination will be collected.

Subsurface soil sample intervals in each soil zone will be selected based on: likely locations for higher contaminant concentration areas such as on top of finer-grained layers or at the bottom of coarser-grained layers; and PID results, staining, odor, or other field-observable indications of intervals with highest potential contamination.

Soil sampling for VOCs and the use of a PID with a 10.6 eV lamp will be conducted using Method 5035A and the IDEM Technical Guidance Document *Sampling Soil and Waste for Volatile Organic Compounds (VOCs)* (August 15, 2012), which is included as **Attachment B** of this SAP. As noted in the Technical Guidance Document, a fresh surface of the soil core will be created just prior to sub-sampling by Method 5035A.

Samplers will wear nitrile gloves when handling samples. Gloves will be changed between each sample. The samples will be submitted for laboratory analysis of the constituents listed in **Table 2**. As noted in **Table 5**, three 40-ml glass vials with Teflon®-lined septum will be required for each sample interval.

At soil borings not completed with monitoring wells, the borings will be permanently abandoned by an Indiana-licensed well driller immediately after screening and sampling in a manner consistent with IDEM’s Nonrule Policy Document #WASTE-053NPD, *Drilling Procedures and Monitoring Well Construction Guidelines* (March 17, 2009) which is included as **Attachment C** of this SAP. Wilcox staff will oversee the abandonment of the borings and describe the procedures in the field notebook.

5.2 Groundwater Sampling

Monitoring wells will be constructed with 2-inch diameter polyvinyl chloride (“PVC”), with ten feet of 0.010-inch machine-slotted PVC screen installed across the apparent water table and solid 2-inch PVC pipe to grade. Alternate screen length and/or slot sizing will be utilized if determined to be appropriate for the data quality objectives. Monitoring well construction will be in accordance with IDEM's Nonrule Policy Document #WASTE-053NPD, *Drilling Procedures and Monitoring Well Construction Guidelines* (March 17, 2009) which is included as **Attachment C** of this SAP.

The wells will be constructed using direct-push, hollow-stem auger, or sonic drilling technology, as appropriate, with annular sand pack installed around the screen to approximately one to two feet above the top of the screen. A bentonite chip seal will be installed above the sand pack to approximately 6 inches below the surface and hydrated with distilled water or municipal potable water at the time of installation. At this time, wells are not anticipated to a depth that would require slurry grout in place of bentonite chips. The wells will be completed at the surface with a bolt-down flush or stick-up steel cover set in concrete depending on the location. Expandable locking caps will seal the well at the top of the casing. A well construction diagram will be prepared for each monitoring well. An example is included in **Attachment A**.

Following installation, monitoring wells will be developed to help provide low-turbidity representative groundwater samples. Well development will be started no sooner than 24 hours following the installation of the wells to allow the bentonite seal to set. Groundwater will be evacuated during development with a peristaltic pump with dedicated disposable tubing, an electric submersible pump, or dedicated disposable polyethylene or PVC bailers. The wells will be developed until low turbidity water is produced based on qualitative observations. The development method and volume of water removed during development will be recorded in the field notebook and on the well construction diagram.

Groundwater measurements and samples from monitoring wells will be collected using the methods described in the next subsections. Groundwater samples should be collected at least 24-hours after completion of well development activities. During water level measurements and sample withdrawal, special care will be taken to avoid physically altering or chemically contaminating samples. A new pair of nitrile sampling gloves will be donned prior to collecting the groundwater samples at each well.

5.2.1 Depth-to-Groundwater Measurement

Prior to well purging and collection of any groundwater samples, an interface probe will be utilized to measure the depth to groundwater and, if present, the depth to any product from top-of-casing ("TOC") at all monitoring well locations within one 24-hour period.

The specific procedures to be utilized are as follows:

- Before the water level readings are taken at a monitoring well, the meter buzzer and light will be checked by using the test button. If the buzzer does not sound or the indicator light is not lit, the battery or batteries will be replaced. If this does not correct the problem, the meter will be returned to the manufacturer for repair. This check will be performed, if possible, before mobilization to the site;

- The expandable monitoring well caps will be removed prior to the gauging event to allow for groundwater elevation to equilibrate with the atmospheric pressure;

- The water level measurements will be taken by slowly lowering the meter tip and tape into the monitoring well until the buzzer and the light signal that liquid has been reached. The measuring point on the monitoring well will be the north side of the well or a point previously marked by a surveyor;

- The meter tip and tape will be raised and lowered until the buzzer and light signal are repeated twice at a given point. If the water level changes (barometric compensation of a confined potentiometric surface), measurements will be taken at intervals until a stable reading is obtained; and

- The final stabilized depth to water measurement and time measured will be recorded in the field notebook.

The static water level will be recorded on the Groundwater Monitoring Form (**Attachment D**) and/or in the field book prior to purging and sampling the well. Groundwater elevations will be calculated by subtracting the measured depth to water from the surveyed TOC elevation. The field measurements from the field notebook and/or Groundwater Monitoring Form will later be used to prepare potentiometric surface maps.

5.2.2 Sample Collection

Micro-purge sampling will be used to collect groundwater samples from the monitoring wells. The wells will be micro-purged using an in-well bladder or centrifugal pump with dedicated Teflon-lined tubing in accordance with the IDEM Technical Guidance Document *The Micro-Purge Sampling Option* (June 6, 2012), included as **Attachment E**. If turbidity readings increase during purging, the pumping rate will be decreased. Pumping rate will start at 100-300 milliliters per limit and be limited to 1 liter per minute, maintaining a drawdown less than 0.30 feet. If during purging a well goes dry before field measurements have stabilized, the well will be allowed to recharge and then will be sampled by bailer per the guidelines discussed in the IDEM Technical Guidance Document *The Non-Purge Sampling Option* (June 6, 2012), included in **Attachment E**.

If, based on water level measurements, there is not enough water in a well to use a pump, the wells will be bailed of three well volumes, or bailed dry, and sampled. Dedicated disposable polyethylene bailers will be used. If a well is bailed, field geochemical parameters will not be collected. If a well is bailed dry before three volumes have been purged, the well will be allowed to recharge a maximum of 24 hours or until there is sufficient water for sample collection, and then will be sampled by bailer per the guidelines in **Attachment E**.

During micro-purging, a multi-parameter meter with in-line flow-through cell will be used to collect field measurements of pH, temperature, specific conductance, dissolved oxygen (“DO”), oxidation-reduction potential (“ORP”), and turbidity at five-minute intervals. Stability is achieved when three consecutive readings do not vary more than 10% for turbidity and DO, 3% for conductivity and temperature, 10 microvolts for ORP, and 0.1 units for pH. If stability is not attainable after 30 minutes, only one of the following 3 parameters are required for stabilization: oxidation-reduction potential, dissolved oxygen and/or turbidity. Instruments used for the measurement of groundwater parameters will be operated, calibrated, and maintained in the field in accordance with the manufacturer’s instructions (see Section 2.0 of the QAPP).

A description of each well's response to purging and the field measurements will be recorded in the field notebook and/or the Groundwater Monitoring Form (**Attachment D**).

The groundwater samples will be submitted for laboratory analysis of the constituents in Table 1. Sample container information is included in Table 5.

5.3 Vapor Sampling

Summa canisters or SVI thermal desorption tubes will be used to collect sub-slab and indoor air samples. Sampling data will be collected on the *Soil Gas & Indoor Air Sampling Data Sheet* included in **Attachment F**.

Sub-slab sampling ports will consist of a Vapor Pin™ installed in a concrete floor slab. The Vapor Pin™ will be installed as described in the manufacturer’s installation procedures, included in **Attachment G**. Potentially influential features in the vicinity of the sub-slab sampling port, e.g., floor joints and cracks, floor drains, sumps, doors, windows, HVAC system components, etc. will be recorded in the bound field notebook. Sampling will take place a minimum of two hours following Vapor Pin™ installation to allow sub-slab equilibrium to be reestablished.

The numbered Summa canisters will be certified clean by the laboratory and provided with flow controllers and a vacuum gauge. The SVI™ thermal desorption tube will be fitted to Teflon® tubing into Masterflex® tubing on a sampling pump. The sampling train from sampling port through sample device will be tested for leaks at each location prior to sampling and data recorded on the *Sub-Slab Sampling Leak Test Data Form* included in **Attachment H**. A temporary shroud will be constructed around the sampling train and filled with helium tracer gas. A helium detector will be attached to the sampling train using a t-valve. If the helium concentration measured in the sampling train is less than 10% of the concentration of helium under the shroud, the sub-slab sample port passes the leak check. If not, the port will be reinstalled elsewhere and the test repeated, taking care to select a location where the concrete slab is free of cracks, spalling, or other compromised integrity. To collect a vapor sample, the shroud is removed and the t-valve is closed.

After the sub-slab port with canister assembly has passed the leak check, the identification number of the canister and flow controller, as well as the initial vacuum on the canister, will be recorded on the chain of custody, taking care to use only canisters with an initial vacuum of 26 to 30 inches of mercury and canisters with an initial vacuum that does not differ from the initial vacuum recorded by the laboratory prior to shipment. If the vacuum has decreased, the canister purity has been compromised by air drawn in through loose fitting(s) and the canister cannot be used for sampling.

Wilcox will purge the sample tubing of five tubing volumes prior to opening the tubing to the sample collection device. Sample start time will be recorded on the chain of custody. Summa canister samples will be collected over the course of eight to 24 hours with an appropriately calibrated flow controller. Before the pre-determined duration of the sampling is reached, Wilcox will verify the canister vacuum is greater than zero, close the tubing and canister valves, and record the ending vacuum and time on the chain of custody. Canisters reading zero vacuum will have vacuum verified at the laboratory and analyzed if a vacuum still remains. Wilcox will note TO-15 analysis on the chain of custody and submit the canisters to the laboratory.

For samples with the SVI thermal desorption tube, samples will be drawn through the tube for ten minutes using the sampling pump calibrated to a flow rate of 200 mL/minute, resulting in a total sample volume of 2 liters. Wilcox will note TO-17 analysis on the chain of custody, store samples at 4 degrees C, and submit the tubes to the laboratory.

For indoor air samples, the canister intake will be placed at breathing zone height using an extension tube from a canister on the floor or by placing the canister on an elevated surface. The assembly leak testing, sampling, and recordkeeping are the same as for sub-slab sampling. Prior to indoor air sampling, Wilcox will complete the *Indoor Air Building Survey Form* included in **Attachment I**.

5.4 Quality Assurance / Quality Control Sampling

Field duplicates will be collected at the ratio of one per every 20 or fewer samples of soil or groundwater. Matrix spike/matrix spike duplicate (“MS/MSD”) samples will be collected at a ratio of one per every 20 or fewer samples of soil or groundwater. Quality assurance/quality control (“QA/QC”) samples will be submitted for analysis of the same parameters for which the associated samples are to be analyzed.

Field duplicate samples will be collected from the same depth interval, at the same time, and with the same sampling procedures as the investigative sample. Field duplicate samples will be collected in an alternating manner (i.e., one investigative sample vial will be collected, then one duplicate sample vial, etc.) until all necessary vials are filled for a given analysis.

MS/MSD samples will be preserved, handled, and delivered to the laboratory following the same procedures as those used for the investigative samples. One sample volume will be collected for the investigative groundwater sample and two additional volumes will be collected for the MS/MSD sample. The investigative and MS/MSD samples will be collected in an alternating fashion, as described above for field duplicate samples. The samples selected for MS/MSD analysis will also be properly designated and recorded on the COC forms, Sampling Field Data Forms, boring logs, labels, and in the field notebook.

EQB samples will be collected at a time in between the completed sampling of the first well and the start of sampling of the last well at a rate of one per sampling event. Equipment blanks will be collected by pouring distilled water over the cleaned pump or tip of the water level indicator and decanted into the appropriate sample containers. The sample will be properly identified on all appropriate media and submitted for analysis of the same parameters for which the associated samples are to be analyzed.

5.5 Investigation-Derived Wastes

Wastes generated on Site will be managed to prevent impacting clean areas and to comply with existing regulations. Soil cuttings, well purge water and decontamination water will be placed in 55-gallon U.S. Department of Transportation approved drums. Contained water will be evaluated for proper disposal after sample results are received. Drums will be labeled as to their contents, date, and origin, and labeled to indicate disposal is pending analytical results. Wilcox may apply to IDEM, if necessary, for a contained-in determination for disposal of the groundwater and soil cuttings as non-hazardous waste. Tubing, ropes, bailers, acetate sleeves, and sampling gloves will be discarded after sampling by placing them into plastic garbage bags and disposing of them into on-Site dumpsters.

5.6 Decontamination

Pumps, water level probes, and other sampling equipment will either be dedicated (*e.g.* tubing, bailers, acetate sleeves, and sampling gloves) or will be decontaminated prior to each use.

5.6.1 Personnel Decontamination

Personnel leaving the investigation area are subject to decontamination (as necessary). The decontamination procedure required will be determined by the nature and level of contamination found on-Site. At a minimum, Site personnel will remove loose soils from boots and clothing prior to leaving the Site. More thorough decontamination procedures will be observed as dictated by Site conditions and the Project Manager or Health and Safety Officer.

5.6.2 Sampling Equipment Decontamination

Pumps, water level/interface probe tips, and other equipment inserted into a well will be either dedicated or decontaminated prior to each use. More specifically, the sampling equipment will be decontaminated as follows:

Step 1: Steam clean or scrub equipment with a non-phosphate detergent mixed with distilled water. In the case of a pump with non-dedicated components that contact samples, the pump will be operated within the detergent/water solution for internal cleaning.

Step 2: Rinse with distilled water. In the case of a pump, the pump will be operated in the distilled water for internal cleaning.

Step 3: Rinse (including internal components, where applicable) twice with distilled water or methanol.

Step 4: Air dry.

Step 5: Place in a clean polyethylene bag or wrap in aluminum foil when not in use and during transport to protect the decontaminated equipment from contact with potentially contaminated materials.

6.0 SAMPLE HANDLING AND ANALYSIS

Pace Analytical Services, Inc. ("Pace") of Indianapolis, Indiana has been selected to provide analytical services and will supply appropriate sample containers and shipping containers for analytical samples. However, if new information becomes available that indicates a different laboratory would be more appropriate (analytical capabilities, service area, reporting limits, etc.) a different laboratory may be selected as long as it meets the quality and performance criteria described in this SAP, the QAPP, and relevant referenced guidance documents.

The soil and groundwater sample containers shall be prepared, when necessary, per the USEPA document *Guidelines for the Preparation of Contaminant-Free Sample Containers* (April 1990 revision). Pace's Quality Manual for the laboratory location that will analyze soil and groundwater samples is included in the QAPP as Attachment 3. Pace's Quality Manual for the laboratory location that will analyze vapor samples is included in the QAPP as Attachment 4. Pace's method detection limits, practical reporting limits, laboratory control sample limits, and maximum relative percent difference for the constituents of concern are listed in Tables 1 through 4 of this SAP.

6.1 Sample Preparation, Handling, and Shipment

Table 5 lists the appropriate sample container type and volume, preservation, and holding times for each sample matrix and parameter or set of parameters.

COC procedures will be adhered to in both the field and laboratory. Shipping containers will be provided with COC forms that identify the sample name, date of sample collection, special handling requirements, and the analysis to be performed. Example COC forms for groundwater are included in **Attachment J**. Additional information related to the COC procedures is presented in Section 2.3 of the QAPP.

Following sample preservation (where required), the caps will be securely tightened, the exterior of the sample containers will be wiped off, the sample paperwork will be completed, and the completed sample labels will be attached to the sample containers.

Samples will be placed in a cooler and packing material will be placed around the samples to minimize the possibility of container breakage. The temperature will be maintained at $4^{o}C$ or below with wet ice. COC forms and any other shipping/sample documentation accompanying the shipment will be enclosed in a self-sealing plastic bag and placed inside the cooler. Coolers will be sealed with custody seals in such a manner that the custody seal would be broken if the cooler were opened. The cooler will be closed and sealed with clear tape over the custody seals. If the cooler has a drain, it will be taped shut. The samples will be delivered to the laboratory by Wilcox personnel, delivered to the laboratory by the laboratory's courier, or shipped to the laboratory via an overnight carrier. Samples may be maintained on ice at 4^{o} C or below until a full cooler of samples is accumulated, taking respective holding times into account.

6.2 Sample Analysis

Samples will be collected and analyzed for constituents selected from the lists provided in Tables 1 through 4. Wilcox will request a Level IV data package from the laboratory for closure samples. Routine monitoring samples will have a Level II data package. The following additional QA/QC procedures to be followed during the sample analyses are specified in the indicated QAPP sections:

Section Number	*Description*
1.0	Project Organization
1.0	QA Objective for Measurement Data
2.0	Laboratory Chain-of-Custody Procedures
2.0	Calibration Procedures and Frequency – Laboratory Instruments
2.0	Internal QC Checks – Laboratory Analysis
2.0	Data Review, Validation, and Verification
3.0	Performance and Systems Audits – Internal Laboratory Audits
3.0	Performance and Systems Audits – External Laboratory Audits
3.0	Preventive Maintenance – Laboratory Instruments
2.0	Calibration Procedures and Frequency – Laboratory Instruments
3.0	Reports to Management
3.0	Corrective Actions - Laboratory Analysis
4.0	Data Validation and Usability
4.0	Reconciliation with Data Quality Objectives

6.3 Field documentation

Documentation of field sampling activities will be performed in accordance with Section 2.3 of the QAPP, by using bound field notebooks, and data logs and forms. **Attachments A** and **D** are examples of how the mandatory information will be recorded. An example COC form is provided in **Attachment J**.

7.0 DATA REPORTING

The laboratory is responsible for reporting the data to Wilcox in accordance with the reporting requirements specified in the QAPP. Wilcox is responsible for reporting data to Mr. David Guevara and IDEM.

The data collected during the field investigations will be included in investigation report(s) and quarterly monitoring reports. The reports will describe the sampling activities and information gathered and present an evaluation of the data. The data will be summarized in tables and represented on figures, such as cumulative groundwater elevations and concentrations, detected soil and groundwater concentrations illustrated on Site maps, and potentiometric surfaces and groundwater plumes on Site maps. The laboratory data packages, COC forms, boring logs, and data forms used during the sampling event will be included as appendices.

TABLES

Pace Analytical Services, Inc. (Indianapolis, IN)
Volatiles in Water

Target Analyte	CAS Number	Method	RL ug/L	MDL ug/L	2016 RCG Ground Water Tap Limit ug/L	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
Acetone	67-64-1	SW-846 8260C	100	50	14000	NA	NA	NA
Acrolein	107-02-8	SW-846 8260C	50	25	0.042[a]	NA	NA	NA
Acrylonitrile	107-13-1	SW-846 8260C	100	50	0.52[a]	NA	NA	NA
Benzene	71-43-2	SW-846 8260C	5.0	1.0	5	76-122	51-140	20
Bromobenzene	108-86-1	SW-846 8260C	5.0	2.5	62	NA	NA	NA
Bromodichloromethane	75-27-4	SW-846 8260C	5.0	2.5	80	NA	NA	NA
Bromoform	75-25-2	SW-846 8260C	5.0	2.5	80	NA	NA	NA
Bromomethane	74-83-9	SW-846 8260C	5.0	3.9	7.5	NA	NA	NA
Bromochloromethane	74-97-5	SW-846 8260C	5.0	2.5	83	NA	NA	NA
2-Butanone (MEK)	78-93-3	SW-846 8260C	25	12	5600	NA	NA	NA
n -Butylbenzene	104-51-8	SW-846 8260C	5.0	2.5	1000	NA	NA	NA
sec -Butylbenzene	135-98-8	SW-846 8260C	5.0	2.5	2000	NA	NA	NA
tert -Butylbenzene	98-06-6	SW-846 8260C	5.0	2.5	690	NA	NA	NA
Carbon disulfide	75-15-0	SW-846 8260C	10	5.0	810	NA	NA	NA
Carbon tetrachloride	56-23-5	SW-846 8260C	5.0	2.5	5	NA	NA	NA
Chlorobenzene	108-90-7	SW-846 8260C	5.0	2.5	100	76-118	45-138	20
Chloroethane (Ethyl Chloride)	75-00-3	SW-846 8260C	5.0	2.5	21000	NA	NA	NA
Chloroform	67-66-3	SW-846 8260C	5.0	2.5	80	70-119	50-135	20
Chloromethane	74-87-3	SW-846 8260C	5.0	2.5	190	NA	NA	NA
2-Chlorotoluene	95-49-8	SW-846 8260C	5.0	2.5	240	NA	NA	NA
4-Chlorotoluene	106-43-4	SW-846 8260C	5.0	2.5	250	NA	NA	NA
Dibromochloromethane	124-48-1	SW-846 8260C	5.0	2.5	80	NA	NA	NA
1,2-Dibromoethane (EDB)	106-93-4	SW-846 8260C	5.0	2.5	0.05[a]	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	SW-846 8260C	10	5.0	0.2	NA	NA	NA
Dibromomethane	74-95-3	SW-846 8260C	5.0	2.7	8.3	NA	NA	NA
trans -1,4-Dichloro-2-butene	110-57-6	SW-846 8260C	100	50	0.013[a]	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	SW-846 8260C	5.0	2.5	600	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	SW-846 8260C	5.0	2.5	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	SW-846 8260C	5.0	2.5	75	NA	NA	NA
Dichlorodifluoromethane	75-71-8	SW-846 8260C	5.0	5.0	200	NA	NA	NA

Pace Analytical Services, Inc. (Indianapolis, IN)
Volatiles in Water

Target Analyte	CAS Number	Method	RL ug/L	MDL ug/L	2016 RCG Ground Water Tap Limit ug/L	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
1,1-Dichloroethane	75-34-3	SW-846 8260C	5.0	2.5	28	NA	NA	NA
1,2-Dichloroethane	107-06-2	SW-846 8260C	5.0	2.5	5	NA	NA	NA
1,1-Dichloroethene	75-35-4	SW-846 8260C	5.0	2.5	7	69-127	51-144	20
cis -1,2-Dichloroethene	156-59-2	SW-846 8260C	5.0	2.5	70	NA	NA	NA
trans -1,2-Dichloroethene	156-60-5	SW-846 8260C	5.0	2.5	100	NA	NA	NA
1,2-Dichloropropane	78-87-5	SW-846 8260C	5.0	2.5	5	77-124	56-138	20
1,3-Dichloropropane	142-28-9	SW-846 8260C	5.0	2.5	370	NA	NA	NA
2,2-Dichloropropane	594-20-7	SW-846 8260C	5.0	4.2	NA	NA	NA	NA
1,1-Dichloropropene	563-58-6	SW-846 8260C	5.0	2.5	NA	NA	NA	NA
cis -1,3-Dichloropropene	10061-01-5	SW-846 8260C	5.0	2.5	4.7[b]	NA	NA	NA
trans -1,3-Dichloropropene	10061-02-6	SW-846 8260C	5.0	2.5	4.7[b]	NA	NA	NA
Ethylbenzene	100-41-4	SW-846 8260C	5.0	2.5	700	75-123	36-146	20
Ethyl methacrylate	97-63-2	SW-846 8260C	100	50	630	NA	NA	NA
Hexachloro-1,3-butadiene	87-68-3	SW-846 8260C	5.0	2.5	1.4[b]	NA	NA	NA
n-Hexane	110-54-3	SW-846 8260C	5	2.5	1500	NA	NA	NA
2-Hexanone	591-78-6	SW-846 8260C	25	12	38	NA	NA	NA
Iodomethane	74-88-4	SW-846 8260C	10	6.8	NA	NA	NA	NA
Isopropylbenzene (Cumene)	98-82-8	SW-846 8260C	5.0	2.5	450	84-134	43-159	20
p-Isopropyltoluene	99-87-6	SW-846 8260C	5.0	2.5	NA	NA	NA	NA
Methylene Chloride	75-09-2	SW-846 8260C	5.0	3.2	5	NA	NA	NA
1-Methylnaphthalene	90-12-0	SW-846 8260C	5.0	5.0	11	NA	NA	NA
2-Methylnaphthalene	91-57-6	SW-846 8260C	10	10	36	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	108-10-1	SW-846 8260C	25	12	1200	NA	NA	NA
Methyl-tert-butyl-Ether (MTBE)	1634-04-4	SW-846 8260C	4.0	2.1	140	65-131	43-146	20
Naphthalene	91-20-3	SW-846 8260C	1.4	1.4	1.7	65-134	38-141	20
n -Propylbenzene	103-65-1	SW-846 8260C	5.0	2.5	660	NA	NA	NA
Styrene	100-42-5	SW-846 8260C	5.0	2.5	100	NA	NA	NA
1,1,1,2-Tetrachloroethane	630-20-6	SW-846 8260C	5.0	2.5	5.7	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	SW-846 8260C	5.0	2.5	0.76[a]	72-124	49-138	20
Tetrachloroethene	127-18-4	SW-846 8260C	5.0	1.2	5	69-119	38-139	20
Toluene	108-88-3	SW-846 8260C	5.0	2.5	1000	74-122	44-140	20

Pace Analytical Services, Inc. (Indianapolis, IN)
Volatiles in Water

Target Analyte	CAS Number	Method	RL ug/L	MDL ug/L	2016 RCG Ground Water Tap Limit ug/L	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
1,2,3-Trichlorobenzene	87-61-6	SW-846 8260C	5.0	2.5	7	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	SW-846 8260C	5.0	2.5	70	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	SW-846 8260C	5.0	2.5	200	72-123	51-140	20
1,1,2-Trichloroethane	79-00-5	SW-846 8260C	5.0	2.5	5	NA	NA	NA
Trichloroethene	79-01-6	SW-846 8260C	5.0	1.9	5	75-123	44-146	20
Trichlorofluoromethane	75-69-4	SW-846 8260C	5.0	2.5	5200	NA	NA	NA
1,2,3-Trichloropropane	96-18-4	SW-846 8260C	5.0	2.5	0.0075[a]	NA	NA	NA
1,2,4-Trimethylbenzene	95-63-6	SW-846 8260C	5.0	2.5	15	73-125	32-143	20
1,3,5-Trimethylbenzene	108-67-8	SW-846 8260C	5.0	2.5	120	NA	NA	NA
Vinyl Acetate	108-05-4	SW-846 8260C	50	25	410	NA	NA	NA
Vinyl Chloride	75-01-4	SW-846 8260C	2.0	2.0	2	61-147	43-166	20
Xylenes, Total	1330-20-7	SW-846 8260C	10	5.0	190	75-127	35-146	20
4-Bromofluorobenzene (surr)	460-00-4	SW-846 8260C	NA	NA	NA	79-116	79-116	NA
Dibromofluoromethane (surr)	1868-53-7	SW-846 8260C	NA	NA	NA	84-118	84-118	NA
Toluene-d8 (surr)	2037-26-5	SW-846 8260C	NA	NA	NA	86-110	86-110	NA

NOTES:
Compounds, Reporting Limits, Method Detection Limits, Control Limits, and/or Method versions are subject to change.
[a]Limit not achievable
[b]Limit may be achievable based on MDL - check with laboratory

Pace Analytical Services, Inc. (Indianapolis, IN)
Volatiles in Soil

Target Analyte	CAS Number	Method	RL mg/Kg	MDL mg/Kg	2016 RCG Soil Direct Contact Residential Limit mg/Kg	2016 RCG Soil MTG Residential Limit mg/Kg	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
Acetone	67-64-1	SW-846 8260C	0.1	0.05	85000	57	NA	NA	NA
Acrolein	107-02-8	SW-846 8260C	0.1	0.05	0.2	0.00017[a]	NA	NA	NA
Acrylonitrile	107-13-1	SW-846 8260C	0.1	0.05	3.5	0.0023[a]	NA	NA	NA
Benzene	71-43-2	SW-846 8260C	0.005	0.001	17	0.051	72-120	36-144	20
Bromobenzene	108-86-1	SW-846 8260C	0.005	0.0025	410	0.84	NA	NA	NA
Bromodichloromethane	75-27-4	SW-846 8260C	0.005	0.0025	4.1	0.43	NA	NA	NA
Bromoform	75-25-2	SW-846 8260C	0.005	0.0032	270	0.42	NA	NA	NA
Bromomethane	74-83-9	SW-846 8260C	0.005	0.004	9.5	0.038	NA	NA	NA
Bromochloromethane	74-97-5	SW-846 8260C	0.005	0.0025	210	0.41	NA	NA	NA
2-Butanone (MEK)	78-93-3	SW-846 8260C	0.025	0.012	28000	23	NA	NA	NA
n -Butylbenzene	104-51-8	SW-846 8260C	0.005	0.0025	110	64	NA	NA	NA
sec -Butylbenzene	135-98-8	SW-846 8260C	0.005	0.0025	150	120	NA	NA	NA
tert -Butylbenzene	98-06-6	SW-846 8260C	0.005	0.0025	180	31	NA	NA	NA
Carbon disulfide	75-15-0	SW-846 8260C	0.010	0.005	740	4.8	NA	NA	NA
Carbon tetrachloride	56-23-5	SW-846 8260C	0.005	0.0025	9.1	0.039	NA	NA	NA
Chlorobenzene	108-90-7	SW-846 8260C	0.005	0.0025	390	1.4	72-115	16-140	20
Chloroethane	75-00-3	SW-846 8260C	0.005	0.0025	2100	120	NA	NA	NA
Chloroform	67-66-3	SW-846 8260C	0.005	0.0025	4.5	0.44	66-116	39-136	20
Chloromethane	74-87-3	SW-846 8260C	0.005	0.0025	150	0.98	NA	NA	NA
2-Chlorotoluene	95-49-8	SW-846 8260C	0.005	0.0025	910	4.7	NA	NA	NA
4-Chlorotoluene	106-43-4	SW-846 8260C	0.005	0.0025	250	4.8	NA	NA	NA
Dibromochloromethane	124-48-1	SW-846 8260C	0.005	0.0025	120	0.43	NA	NA	NA
1,2-Dibromoethane (EDB)	106-93-4	SW-846 8260C	0.005	0.0025	0.5	0.00028[a]	NA	NA	NA
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	SW-846 8260C	0.005	0.0025	0.074	0.0017[a]	NA	NA	NA
Dibromomethane	74-95-3	SW-846 8260C	0.005	0.0032	34	0.041	NA	NA	NA
trans -1,4-Dichloro-2-butene	110-57-6	SW-846 8260C	0.1	0.05	0.1	0.00012[a]	NA	NA	NA
1,2-Dichlorobenzene	95-50-1	SW-846 8260C	0.005	0.0025	380	12	NA	NA	NA
1,3-Dichlorobenzene	541-73-1	SW-846 8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	106-46-7	SW-846 8260C	0.005	0.0025	36	1.4	NA	NA	NA
Dichlorodifluoromethane	75-71-8	SW-846 8260C	0.005	0.005	120	6	NA	NA	NA
1,1-Dichloroethane	75-34-3	SW-846 8260C	0.005	0.0025	50	0.16	NA	NA	NA
1,2-Dichloroethane	107-06-2	SW-846 8260C	0.005	0.0025	6.4	0.028	NA	NA	NA
1,1-Dichloroethene	75-35-4	SW-846 8260C	0.005	0.0025	320	0.05	64-133	36-162	20
cis -1,2-Dichloroethene	156-59-2	SW-846 8260C	0.005	0.0025	220	0.41	NA	NA	NA

Pace Analytical Services, Inc. (Indianapolis, IN)
Volatiles in Soil

Target Analyte	CAS Number	Method	RL mg/Kg	MDL mg/Kg	2016 RCG Soil Direct Contact Residential Limit mg/Kg	2016 RCG Soil MTG Residential Limit mg/Kg	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
trans -1,2-Dichloroethene	156-60-5	SW-846 8260C	0.005	0.0025	1900	0.62	NA	NA	NA
1,2-Dichloropropane	78-87-5	SW-846 8260C	0.005	0.0025	14	0.033	74-119	43-138	20
1,3-Dichloropropane	142-28-9	SW-846 8260C	0.005	0.0025	1500	2.6	NA	NA	NA
2,2-Dichloropropane	594-20-7	SW-846 8260C	0.005	0.0025	NA	NA	NA	NA	NA
1,1-Dichloropropene	563-58-6	SW-846 8260C	0.005	0.0025	NA	NA	NA	NA	NA
cis -1,3-Dichloropropene	10061-01-5	SW-846 8260C	0.005	0.0025	25	0.034	NA	NA	NA
trans -1,3-Dichloropropene	10061-02-6	SW-846 8260C	0.005	0.0025	25	0.034	NA	NA	NA
Ethylbenzene	100-41-4	SW-846 8260C	0.005	0.0025	81	16	70-121	15-147	20
Ethyl methacrylate	97-63-2	SW-846 8260C	0.1	0.05	1100	3	NA	NA	NA
Hexachloro-1,3-butadiene	87-68-3	SW-846 8260C	0.005	0.0025	17	0.054	NA	NA	NA
n-Hexane	110-54-3	SW-846 8260C	0.005	0.0025	140	210	NA	NA	NA
2-Hexanone	591-78-6	SW-846 8260C	0.1	0.05	280	0.18	NA	NA	NA
Iodomethane	74-88-4	SW-846 8260C	0.1	0.05	NA	NA	NA	NA	NA
Isopropylbenzene (Cumene)	98-82-8	SW-846 8260C	0.005	0.0025	270	15	78-130	10-163	20
p-Isopropyltoluene	99-87-6	SW-846 8260C	0.005	0.0025	NA	NA	NA	NA	NA
Methylene Chloride	75-09-2	SW-846 8260C	0.02	0.01	490	0.025	NA	NA	NA
1-Methylnaphthalene	90-12-0	SW-846 8260C	0.01	0.01	250	1.2	NA	NA	NA
2-Methylnaphthalene	91-57-6	SW-846 8260C	0.01	0.01	340	3.7	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	108-10-1	SW-846 8260C	0.03	0.012	3400	28	NA	NA	NA
Methyl-tert-butyl-Ether (MTBE)	1634-04-4	SW-846 8260C	0.005	0.0025	660	0.63	68-123	48-145	20
Naphthalene	91-20-3	SW-846 8260C	0.005	0.0025	53	0.11	63-125	10-132	20
n -Propylbenzene	103-65-1	SW-846 8260C	0.005	0.0025	260	25	NA	NA	NA
Styrene	100-42-5	SW-846 8260C	0.005	0.0025	870	2.2	NA	NA	NA
1,1,1,2-Tetrachloroethane	630-20-6	SW-846 8260C	0.005	0.0025	28	0.043	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	SW-846 8260C	0.005	0.0025	8.4	0.0059	67-129	12-174	20
Tetrachloroethene	127-18-4	SW-846 8260C	0.005	0.0014	110	0.045	66-118	14-156	20
Toluene	108-88-3	SW-846 8260C	0.005	0.0025	820	14	68-121	24-151	20
1,2,3-Trichlorobenzene	87-61-6	SW-846 8260C	0.005	0.0025	88	0.42	NA	NA	NA
1,2,4-Trichlorobenzene	120-82-1	SW-846 8260C	0.005	0.0025	81	4.1	NA	NA	NA
1,1,1-Trichloroethane	71-55-6	SW-846 8260C	0.005	0.0025	640	1.4	67-123	37-144	20
1,1,2-Trichloroethane	79-00-5	SW-846 8260C	0.005	0.0025	2.1	0.032	NA	NA	NA
Trichloroethene	79-01-6	SW-846 8260C	0.005	0.001	5.7	0.036	73-120	21-164	20
Trichlorofluoromethane	75-69-4	SW-846 8260C	0.005	0.0025	1200	66	NA	NA	NA
1,2,3-Trichloropropane	96-18-4	SW-846 8260C	0.005	0.0025	0.071	0.000065[a]	NA	NA	NA

Pace Analytical Services, Inc. (Indianapolis, IN)
Volatiles in Soil

Target Analyte	CAS Number	Method	RL mg/Kg	MDL mg/Kg	2016 RCG Soil Direct Contact Residential Limit mg/Kg	2016 RCG Soil MTG Residential Limit mg/Kg	LCS Limits % Rec.	MS/MSD Limits % Rec.	RPD Max %
1,2,4-Trimethylbenzene	95-63-6	SW-846 8260C	0.005	0.0025	81	0.44	66-118	10-157	20
1,3,5-Trimethylbenzene	108-67-8	SW-846 8260C	0.005	0.0025	180	3.4	NA	NA	NA
Vinyl Acetate	108-05-4	SW-846 8260C	0.1	0.05	1300	1.7	NA	NA	NA
Vinyl Chloride	75-01-4	SW-846 8260C	0.005	0.0025	0.83	0.014	54-155	32-177	20
Xylenes, Total	1330-20-7	SW-846 8260C	0.010	0.005	260	3.7	69-122	12-148	20
4-Bromofluorobenzene (surr)	460-00-4	SW-846 8260C	NA	NA	NA	NA	65-127	65-127	NA
Dibromofluoromethane (surr)	1868-53-7	SW-846 8260C	NA	NA	NA	NA	70-128	70-128	NA
Toluene-d8 (surr)	2037-26-5	SW-846 8260C	NA	NA	NA	NA	72-139	72-139	NA

NOTES:
Compounds, Reporting Limits, Method Detection Limits, Control Limits, and/or Method versions are subject to change.
[a]Limit not achievable
[b]Limit may be achievable based on MDL - check with laboratory

Analyte	CAS #	MDL (ppbv)	PRL (ppbv)	MW	MDL (ug/m^3)	PRL (ug/m^3)	LCS Lower	LCS Upper	DUP RPD
1,1,1-Trichloroethane	71-55-6	0.0250	0.2	133.4047	0.139	1.11	72	140	25
1,1,2,2-Tetrachloroethane	79-34-5	0.0334	0.1	167.8498	0.233	0.70	68	137	25
1,1,2-Trichloroethane	79-00-5	0.0437	0.1	133.4047	0.243	0.55	66	138	25
1,1,2-Trichlorotrifluoroethane	76-13-1	0.0205	0.2	187.3762	0.160	1.60	70	132	25
1,1-Dichloroethane	75-34-3	0.0341	0.2	98.9596	0.140	0.82	68	137	25
1,1-Dichloroethene	75-35-4	0.0255	0.2	96.9438	0.103	0.81	73	138	25
1,2,4-Trichlorobenzene	120-82-1	0.0482	0.2	181.4487	0.364	1.51	48	150	25
1,2,4-Trimethylbenzene	95-63-6	0.0244	0.2	120.1938	0.122	1.00	75	134	25
1,2-Dibromoethane	106-93-4	0.0300	0.2	187.8616	0.234	1.56	75	132	25
1,2-Dichlorobenzene	95-50-1	0.0230	0.2	147.0036	0.141	1.22	71	129	25
1,2-Dichloroethane	107-06-2	0.0289	0.1	98.9596	0.119	0.41	73	139	25
1,2-Dichloropropane	78-87-5	0.0323	0.2	112.9864	0.152	0.94	70	130	25
1,3,5-Trimethylbenzene	108-67-8	0.0414	0.2	120.1938	0.207	1.00	75	133	25
1,3-Butadiene	106-99-0	0.0376	0.2	54.0914	0.085	0.45	66	135	25
1,3-Dichlorobenzene	541-73-1	0.0379	0.2	147.0036	0.232	1.22	75	131	25
1,4-Dichlorobenzene	106-46-7	0.0324	0.2	147.0036	0.198	1.22	69	135	25
2-Butanone (MEK)	78-93-3	0.0912	0.2	72.1066	0.273	0.6	67	131	25
2-Hexanone	591-78-6	0.0512	0.2	100.1602	0.213	0.83	72	130	25
2-Propanol	67-63-0	0.0374	0.5	60.1	0.093	1.25	66	133	25
4-Ethyltoluene	622-96-8	0.0349	0.2	120.1938	0.174	1.00	75	130	25
4-Methyl-2-pentanone (MIBK)	108-10-1	0.0411	0.2	100.1602	0.171	0.83	68	134	25
Acetone	67-64-1	0.5000	1	58.0798	1.207	2.414	63	144	25
Benzene	71-43-2	0.0362	0.1	78.1134	0.118	0.33	64	139	25
Benzyl Chloride	100-44-7	0.1000	0.2	126.58	0.526	1.05	76	129	25
Bromodichloromethane	75-27-4	0.0268	0.2	163.8289	0.182	1.36	77	134	25
Bromoform	75-25-2	0.0307	0.2	252.7309	0.323	2.10	72	130	25
Bromomethane	74-83-9	0.0685	0.2	94.9387	0.270	0.79	71	132	25
Carbon Disulfide	75-15-0	0.0228	0.2	76.131	0.072	0.63	56	139	25
Carbon tetrachloride	56-23-5	0.0500	0.1	153.823	0.320	0.64	79	150	25
Chlorobenzene	108-90-7	0.0227	0.2	112.5585	0.106	0.94	71	132	25
Chloroethane	75-00-3	0.0600	0.2	64.5145	0.161	0.54	71	129	25
Chloroform	67-66-3	0.0360	0.1	119.3779	0.179	0.496	73	136	25
Chloromethane	74-87-3	0.0917	0.2	50.4877	0.192	0.42	52	143	25
cis-1,2-Dichloroethene	156-59-2	0.0487	0.2	96.9438	0.196	0.81	64	137	25
cis-1,3-Dichloropropene	10061-01-5	0.0295	0.2	110.9706	0.136	0.92	75	128	25
Cyclohexane	110-82-7	0.0360	0.2	84.1608	0.126	0.70	62	143	25
Dibromochloromethane	124-48-1	0.1000	0.2	208.2799	0.866	1.73	76	136	25
Dichlorodifluoromethane	75-71-8	0.0216	0.2	120.9138	0.109	1.01	70	141	25
Dichlorotetrafluoroethane	76-14-2	0.0351	0.2	170.9216	0.249	1.42	71	139	25
Ethanol	64-17-5	0.1646	0.5	46.07	0.315	0.96	60	144	25
Ethyl Acetate	141-78-6	0.0345	0.2	88.106	0.126	0.73	64	137	25
Ethyl Benzene	100-41-4	0.0405	0.2	106.167	0.179	0.88	71	136	25
Hexachlorobutadiene	87-68-3	0.0379	0.2	260.762	0.411	2.20	51	150	25
m&p-Xylene	106-42-3	0.0318	0.4	106.167	0.140	1.77	71	134	25
Methyl Tert Butyl Ether	1634-04-4	0.0243	0.2	88.1492	0.089	0.73	73	134	25
Methylene chloride	75-0902	0.0653	1	84.9328	0.231	3.53	64	130	25
Naphthalene	91-20-3	0.0483	0.5	128.1732	0.258	2.66	43	150	25
n-Heptane	142-82-5	0.0390	0.2	100.2034	0.162	0.83	63	135	25
n-Hexane	110-54-3	0.0281	0.2	86.1766	0.101	0.72	69	135	25
o-Xylene	95-47-6	0.1000	0.2	106.167	0.441	0.88	75	134	25

Propylene	115-07-1	0.0628	0.2	42.0804	0.110	0.35	58	135	25
Styrene	100-42-5	0.0313	0.2	104.1512	0.135	0.87	75	133	25
Tetrachloroethene	127-18-4	0.0273	0.1	165.834	0.188	0.69	66	137	25
Tetrahydrofuran	109-99-9	0.0464	0.2	72.1066	0.139	0.60	58	135	25
Toluene	108-88-3	0.0351	0.2	92.1402	0.135	0.77	70	129	25
trans-1,2-dichloroethene	156-60-5	0.0404	0.2	96.9438	0.163	0.81	61	140	25
trans-1,3-Dichloropropene	10061-02-6	0.0328	0.2	110.9706	0.151	0.92	75	134	25
Trichloroethene	79-01-6	0.0326	0.1	131.3889	0.178	0.55	70	134	25
Trichlorofluoromethane	75-69-4	0.0242	0.2	137.3684	0.138	1.14	67	140	25
Vinyl Acetate	108-05-4	0.0971	0.2	86.0902	0.348	0.72	60	139	25
Vinyl chloride	75-01-4	0.0359	0.1	62.4987	0.093	0.26	72	129	25

EXTRA ANALYTES (available upon request at an additional cost)

							LCS		DUP
Analyte	**CAS #**	**MDL (ppbv)**	**PRL (ppbv)**	**MW**	**MDL (ug/m^3)**	**PRL (ug/m^3)**	**Lower**	**Upper**	**RPD**
1,2,3-Trimethylbenzene		0.0355	0.2	120.19	0.177	1.00	75	133	25
Chlorodifluoromethane		0.0539	0.2	86.47	0.194	0.72	73	130	25
Di-isopropyl Ether		0.0497	0.2	102.18	0.211	0.85	70	130	25
Ethyl Tert-Butyl Ether		0.1000	0.2	102.17	0.425	0.85	70	130	25
Isopentane		0.0588	0.2	72.15	0.176	0.60	70	130	25
Methylcyclohexane		0.0652	0.2	98.186	0.266	0.82	70	130	25
p-Isopropyltoluene		0.0287	0.2	134.22	0.160	1.12	69	137	25
Tert Amyl Methyl Ether		0.0484	0.2	88.15	0.177	0.73	70	130	25
Tert-Butyl Benzene		0.0244	0.2	166.217	0.168	1.38	70	130	25
1,4-Dioxane	123-91-1	0.0587	1	88.1	0.215	3.66	65	154	25
2,2,4-Trimethylpentane	540-84-1	0.0286	0.5	114.22	0.136	2.37	76	130	25
Acrolein	107-02-8	0.0981	0.5	56.06	0.229	1.17	65	143	25
Acrylonitrile	107-13-1	0.0632	0.5	53.06	0.139	1.10	72	144	25
Allyl Chloride	107-05-1	0.0879	0.5	76.52	0.280	1.59	66	145	25
N-Butylbenzene	104-51-8	0.0240	0.5	134.2206	0.134	2.79	66	142	25
N-Propylbenzene	103-65-1	0.0323	0.5	120.1938	0.162	2.50	70	134	25
Sec- Butylbenzene	135-98-8	0.1000	0.5	134.2206	0.558	2.79	67	134	25
Tert Butyl Alcohol (TBA)	75-65-0	0.0737	0.5	74.12	0.227	1.54	70	130	25
Vinyl Bromide	593-60-2	0.0429	0.5	106.95	0.191	2.22	70	130	25
Isopropylbenzene	98-82-8	0.1000	0.5	120.194	0.500	2.50	72	139	25
THC as gas		7.0000	14	104.467	30.400	60.80	66	135	25
Xylene (Total)	1330-20-7	0.1243	0.6	106.17	0.548	2.65	50	125	25

Surrogates								
1,4-Dichlorobenzene-d4 (S)	3855-82-1						30	150
Hexane-d14 (S)	21666-38-6						30	150
Toluene-d8 (S)	2037-26-5						30	150

Analyte	CAS #	MDL (ng)	PRL (ng)	LCS Lower	LCS Upper	DUP RPD	ug/m3 (1 Liter sample)	ug/m3 (10 Liter sample)	ug/m3 (100 Liter sample)
1,1,2-Trichlorotrifluoroethane	76-13-1	1.191	5	75	139	30	5	0.5	0.05
1,1-Dichloroethene	75-35-4	0.563	2	75	137	30	2	0.2	0.02
1,2-Dichlorobenzene	95-50-1	0.680	5	51	150	30	5	0.5	0.05
1,3-Butadiene	106-99-0	0.515	5	69	134	30	5	0.5	0.05
1,1,1-Trichloroethane	71-55-6	1.329	5	74	136	30	5	0.5	0.05
1,1,2,2-Tetrachloroethane	79-34-5	1.219	5	70	146	30	5	0.5	0.05
1,1,2-Trichloroethane	79-00-5	1.288	5	75	125	30	5	0.5	0.05
1,1-Dichloroethane	75-34-3	0.657	10	78	135	30	10	1	0.1
1,2,4-Trichlorobenzene	120-82-1	1.678	5	30	150	30	5	0.5	0.05
1,2,4-Trimethylbenzene	95-63-6	0.706	5	72	137	30	5	0.5	0.05
1,2-Dibromoethane (EDB)	106-93-4	1.023	5	70	128	30	5	0.5	0.05
1,2-Dichloroethane	107-06-2	0.504	2	75	126	30	2	0.2	0.02
1,2-Dichloropropane	78-87-5	1.003	5	69	134	30	5	0.5	0.05
1,3- Dichlorobenzene	541-73-1	0.779	5	63	142	30	5	0.5	0.05
1,3,5-Trimethylbenzene	108-67-8	0.852	5	73	134	30	5	0.5	0.05
1,4-Dichlorobenzene	106-46-7	0.709	5	58	150	30	5	0.5	0.05
1,4-Dioxane	123-91-1	0.499	2	75	125	30	2	0.2	0.02
2-Butanone (MEK)	78-93-3	0.557	5	53	145	30	5	0.5	0.05
2-Hexanone	591-78-6	0.560	2	69	134	30	2	0.2	0.02
4-Ethyltoluene	622-96-8	0.847	5	74	140	30	5	0.5	0.05
4-Methyl-2- Pentanone (MIBK)	108-10-1	0.648	2	74	137	30	2	0.2	0.02
Acetone	67-64-1	0.622	5	57	142	30	5	0.5	0.05
Acrylonitrile	107-13-1	0.505	5	60	142	30	5	0.5	0.05
Benzene	71-43-2	0.598	2	54	138	30	2	0.2	0.02
Benzyl chloride	100-44-7	0.695	5	50	135	30	5	0.5	0.05
Bromodichloromethane	75-27-4	0.362	5	75	133	30	5	0.5	0.05
Bromoform	75-25-2	1.487	5	68	140	30	5	0.5	0.05
Bromomethane	74-83-9	0.918	2	72	150	30	2	0.2	0.02
Carbon Disulfide	75-15-0	0.504	5	38	140	30	5	0.5	0.05
Carbon Tetrachloride	56-23-5	0.651	5	75	134	30	5	0.5	0.05
Chlorobenzene	108-90-7	0.419	2	75	125	30	2	0.2	0.02
Chlorodibromomethane	124-48-1	1.179	5	73	125	30	5	0.5	0.05
Chloroethane	75-00-3	0.640	2	75	140	30	2	0.2	0.02
Chloroform	67-66-3	0.779	5	75	126	30	5	0.5	0.05
Chloromethane	74-87-3	0.745	2	70	127	30	2	0.2	0.02
cis 1,3-Dichloropropene	10061-01-5	0.810	5	74	129	30	5	0.5	0.05
cis-1,2-Dichloroethene	156-59-2	0.667	2	70	139	30	2	0.2	0.02
Cyclohexane	110-82-7	0.614	2	62	135	30	2	0.2	0.02
Dichlorodifluoromethane	75-71-8	0.723	5	75	134	30	5	0.5	0.05
Ethyl Acetate	141-78-6	0.818	5	52	146	30	5	0.5	0.05
Ethyl benzene	100-41-4	0.397	2	63	140	30	2	0.2	0.02
Hexachlorobutadiene	87-68-3	0.892	5	30	150	30	5	0.5	0.05
Isopropyl alcohol (2-propanol)	67-63-0	0.389	2	58	152	30	2	0.2	0.02
Isopropylbenzene (cumene)	98-82-8	0.478	5	75	135	30	5	0.5	0.05
m,p-Xylene	179601-23-1	0.346	5	65	137	30	5	0.5	0.05
Methyl tert-Butyl Ether	1634-04-4	0.952	2	41	150	30	2	0.2	0.02
Methylene chloride	75-09-2	3.340	20	30	150	30	20	2	0.2
Naphthalene	91-20-3	0.749	5	30	150	30	5	0.5	0.05
n-Butylbenzene	104-51-8	0.663	5	49	150	30	5	0.5	0.05
n-Heptane	142-82-5	0.570	2	65	132	30	2	0.2	0.02
n-Hexane	110-54-3	0.999	2	57	136	30	2	0.2	0.02
n-Propylbenzene	103-65-1	0.271	5	75	136	30	5	0.5	0.05
o-Xylene	95-47-6	0.414	2	64	139	30	2	0.2	0.02
Propylene	115-07-1	0.186	2	30	150	30	2	0.2	0.02
sec-Butylbenzene	135-98-8	0.375	5	67	141	30	5	0.5	0.05
Styrene	100-42-5	0.476	10	69	128	30	10	1	0.1
Tetrachloroethene	127-18-4	0.820	5	64	141	30	5	0.5	0.05
Tetrahydrofuran (THF)	109-99-9	0.460	2	69	140	30	2	0.2	0.02
Toluene	108-88-3	0.569	2	57	133	30	2	0.2	0.02
trans 1,3-Dichloropropene	10061-02-6	10.000	10	74	125	30	10	1	0.1
trans-1,2-Dichloroethene	156-60-5	0.505	2	70	130	30	2	0.2	0.02
Trichloroethene	79-01-6	0.696	5	73	136	30	5	0.5	0.05
Trichlorofluoromethane	75-69-4	0.878	5	75	126	30	5	0.5	0.05
Vinyl acetate	108-05-4	1.307	10	41	150	30	10	1	0.1
Vinyl Chloride	75-01-4	0.389	5	59	150	30	5	0.5	0.05
tert-Amyl Methyl Ether		0.604	2	70	130	30	2	0.2	0.02
tert-Butyl Alcohol (TBA)		0.910	2	70	130	30	2	0.2	0.02
tert-Butylbenzene		0.354	5	70	130	30	5	0.5	0.05
Vinyl Bromide		0.600	2	70	130	30	2	0.2	0.02
p-Isopropyltoluene (p-Cymene)		1.043	5	70	130	30	5	0.5	0.05
Methylcyclohexane		0.675	2	70	130	30	2	0.2	0.02
Ethyl-tert-Butyl Ether		0.582	2	70	130	30	2	0.2	0.02

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Isopentane		0.530	2	70	130	30	2	0.2	0.02
Isopropyl Ether		0.708	2	70	130	30	2	0.2	0.02
Dichlorotetrafluoroethane		0.943	5	75	125	30	5	0.5	0.05
Ethanol		0.438	2	30	150	30	2	0.2	0.02
Chlorodifluoromethane		1.023	5	70	130	30	5	0.5	0.05
Allyl Chloride (3-Chloropropene		0.532	2	70	130	30	2	0.2	0.02
Acrolein		0.471	2	70	130	30	2	0.2	0.02
2,2,4-Trimethylpentane		0.983	5	59	144	30	5	0.5	0.05
1,2,3-Trimethylbenzene		1.031	5	70	130	30	5	0.5	0.05

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THC as Gas (C4-C12)		165.200	330.4	70	130	30	330.4	33.04	3.304

DRO (PAHs)

Acenaphthene	83-32-9	0.211	2	53	143	30	2.00	0.20	0.02
Acenaphthylene	208-96-8	0.153	2	39	148	30	2.00	0.20	0.02
Fluorene	86-73-7	0.558	2	57	147	30	2.00	0.20	0.02
1-Methylnaphthalene	90-12-0	0.551	2	62	138	30	2.00	0.20	0.02
2- Methylnapththalene	91-57-6	0.556	2	53	142	30	2.00	0.20	0.02
Phenanthrene	85-01-8	0.420	2	32	150	30	2.00	0.20	0.02
Diesel Fuel #2		44.409	250	54	142	30	250.00	25.00	2.50

APH

Aliphatic (C05-C08)			41.9	70	130	30	0.00	0.00	0.00
Aliphatic (C09-C12)		28.2	71.7	70	130	30	28.20	2.82	0.28
Aromatic (C09-C10)		2.37	20.5	70	130	30	2.37	0.24	0.02

Table 5. Sample Containers, Preservation Methods, and Holding Times
O'Neal's Clothes Depot Cleaners - Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Task/Matrix	Laboratory Parameters & Methods	Sample Containers	Preservation & Storage	Holding Time[1]
Groundwater Sampling	VOCs (SW-846 Method 8260B)	Three 40-ml glass vials with Teflon®-lined septum	Cool to < or = 6°C HCl to pH<2	14 days
Soil Sampling	VOCs (5035A/SW-846 Method 8260B)	Four 40-ml glass vials with Teflon®-lined septum and 5-gram sample (such as using a TerraCore® sampler);	Cool to < or = 6°C Two vials with deionized water, one vial with methanol, and one vial unpreserved for dry weight	48 hours
Vapor Sampling	VOCs (Methods TO-15 and TO-17)	8-hour: One 1-liter summa canister 24-hour: One 6 liter summa canister 10-minute: One SVI thermal desorption tube	Ambient	30 days

Key:
VOC = Volatile Organic Compounds

Notes:
[1]Holding times are from the date of sampling.

FIGURES

SITE PLAN

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

SCALE 1" = 80'	DATE 09/16/16	FIGURE NO. 1
WILCOX PROJECT # 341.14	PROJECT MANAGER J. KINMAN	FILE NO. 34114001

WILCOX ENVIRONMENTAL ENGINEERING

ATTACHMENT A

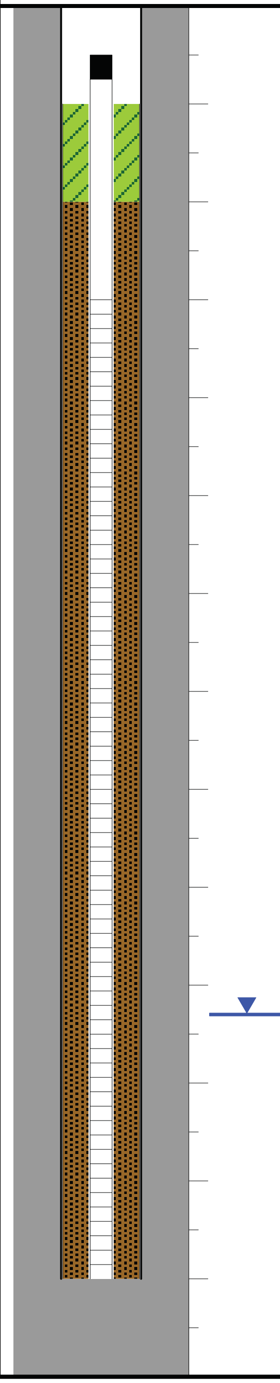
Example Soil Boring Log and Monitoring Well Construction Diagram

WILCOX
ENVIRONMENTAL ENGINEERING
AIR | LAND | WATER

PROJECT:	WILCOX PROJECT #:	
LOCATION:	WELL/BORING ID: **MW-12**	
DRILLING CONTRACTOR:	DRILLER/LICENSE #:	LOGGED BY/CHECK BY:
DRILLING EQUIPMENT: **Geoprobe 6620DT**	GROUND SURFACE ELEV.:	TOC ELEVATION: **NA**
DRILLING METHOD: **Dual Tube/HSA**	TOTAL DEPTH: **14.0'**	DEPTH TO WATER: **10.3'**
SAMPLING METHOD: **Continuous**	DATE STARTED: **10/10/2013**	DATE COMPLETED: **10/10/2013**

Depth (feet)	USCS	Graphic Log	Description	% REC	PID
0			ASPHALT SURFACE		
			CONCRETE		
	SW-SM		BROWNISH YELLOW (10YR 6/6), WELL GRADED SAND WITH SILT, MOIST, MEDIUM DENSE		
1	CL		YELLOWISH BROWN (10YR 5/4), (10YR 5/6, & GRAY (10YR 5/1), SANDY LEAN CLAY, DAMP, STIFF, FRACTURED WITH TRACE GRAVEL * 7.5' DARK GRAY (10YR 4/1), NOT FRACTURED	60	0.0
3				70	0.0
5				90	283
7				100	1952
8–9	CL		INITIAL SAMPLE NO RECOVERY - RESAMPLED DARK GRAY (10YR 4/1), SANDY LEAN CLAY, DAMP, STIFF, TRACE GRAVEL * 10.3' 1/2" SEAM DARK GRAY (10YR 4/1), WELL GRADED SAND WITH SILT, WET, MEDIUM DENSE, FINE SAND, WITH TRACE GRAVEL	80	8.9
11				100	1.2
13				100	1.1
14					

Well Construction



Flush mounted 10" cover
0.75-3.0' 2 in dia., sch. 40 PVC riser
1.0-2.0' Bentonite Seal
2.0-13.0' #4 Quartz Sand Pack
3.0-13.0' 2 in dia., 0.010" slot, sch. 40 PVC well screen
Drilling terminated at 14.0' bgs

NOTES:

ATTACHMENT B

IDEM Technical Guidance Document Sampling Soil and Waste for Volatile Organic Compounds (VOCs)

TECHNICAL GUIDANCE DOCUMENT

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Sampling Soil and Waste for Volatile Organic Compounds (VOCs)

www.idem.IN.gov

Mitchell E. Daniels, Jr. — **Governor**
Thomas W. Easterly — **Commissioner**

100 N. Senate Ave., Indianapolis, IN 46204
Toll Free: (800) 451-6027

Guidance Created: March 20, 2008 Revised: August 15, 2012

Notice

Mention of trade names or commercial products does not constitute endorsement or recommendation by the IDEM for use. This guidance was formerly titled "Supplemental Guidance for Sampling Soil and Waste Samples for Volatile Organic Compounds (VOCs)".

Related Guidance

Method 5035A, "Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples," in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, Third Edition, Final Update III; updated method: July 2002. [**Method 5035A**]

Scope

This technical guidance is intended to provide additional information regarding the collection and preservation of volatile organic compounds (VOCs) within soil and solid waste samples to be analyzed at a stationary, off-site laboratory. Pre-sampling planning is emphasized as essential for meeting sampling objectives. Method 5035A contains critical information on sampling and analytical requirements and thus should be consulted alongside this document when developing site-specific sampling plans.

The techniques described in Method 5035A represent a significant departure from those traditionally used in the environmental field for sampling of VOCs in solid materials. Traditional sampling methods have been shown to result in losses of VOCs that are significant to certain project objectives. The Method 5035A procedures are designed to minimize losses of VOCs due to volatilization and biodegradation. This guidance will identify instances where it is critical to have the greater accuracy provided by Method 5035A.

Applicability

This supplemental guidance applies to all Office of Land Quality programs that require the laboratory analysis of VOCs or Total Petroleum Hydrocarbons (TPH – see discussion below) in soil or solid waste.

General Guidance

Method 5035A does not provide detailed guidance regarding systematic planning, sampling design, retrieval of sub-surface soil cores, or the actual steps for determining VOCs in the laboratory. These and other aspects of a sampling project should be adjusted as needed to assure losses of sample VOCs are minimized.

Several options for the collection, preservation, and storage of samples for VOC analysis are described in Appendix A of SW-846 Method 5035A. Special considerations for samples to be extracted using the Synthetic Precipitation Leaching Procedure (SPLP) prior to analysis are described below. The necessity for representative sampling demands that sample collection and preservation options are selected based on the requirements of the data quality objectives (DQOs) for the project. The selection of a specific Method 5035A sampling technique for a project is not solely based upon availability of sample containers, convenience or simplicity of use, or lowest price.

To minimize loss of VOCs, sub-surface soils are retrieved and sub-sampled as quickly as possible, taking special care to limit exposure and disaggregation of the soil's physical structure. Once a core barrel has been opened, the collection of sub-samples is the first activity performed (i.e., pre-empting even the logging of sub-surface core sample recovery and other soil characteristics). If a second core is obtained before the first core has been logged, the logging of the first core should be set aside until the second core has been sampled. In some cases, this is a change in the order in which work is done. The use of intermediate storage containers (e.g., core barrel liners, plastic bags, large glass jars) to hold soil for extended periods prior to sub-sampling by Method 5035A defeats the project intent and is to be avoided. The field log or boring log should show the time the sub-surface core is retrieved and the time sub-samples are collected.

If the surface of a soil core has been exposed for more than a minute or two (due to an unforeseen delay, field screening to determine the interval to be sampled, etc.), a fresh surface is created just prior to sub-sampling by Method 5035A. Sampling personnel should be ready to take sub-samples immediately after the sub-surface core is retrieved. Drill rig personnel should adjust their pace accordingly to allow collection of sub-samples.

Sampling techniques and equipment will vary slightly depending on the type of soil (cohesive, non-cohesive, cemented, oily, etc.) or solid waste to be collected. Additional information regarding this issue may be found in Appendix A, Section 7.1 of SW-846 Method 5035A.

In order to provide the laboratory with enough sample volume to account for potential re-analysis and to meet applicable quality assurance and quality control (QA/QC) requirements, it may be necessary to collect several (typically 3-5) sub-samples from each interval sampled within each sub-surface core. One additional sub-sample is also needed from each core to make a dry weight determination. Sampling personnel should plan accordingly prior to site mobilization to assure that sufficient equipment and containers are available at the time of sampling.

Based on field screening information, sampling personnel may determine that the sub-samples collected from a particular sub-surface core interval do not need to be sent to the laboratory for analysis and thus may be discarded. The time and equipment needed for collecting these discarded sub-samples should be factored into the overall cost for the sampling event. Strategic planning prior to site mobilization may limit the number of discarded sub-samples (and related costs) while still meeting project DQOs and requirements for representative sampling.

Project-Specific Sampling Planning Guidance

IDEM Remediation Closure Guide (RCG) [see reference below] Section 3.2.4 states:

- Use U.S. EPA SW-846 Method 5035A (as updated) to minimize VOC loss, especially when collecting soil closure samples for VOC analysis.

- The use of specialized containers and preservation techniques as described in Method 5035A may be unnecessary for samples collected within areas of known or suspected contamination, as long as the sampling method meets project objectives.

- IDEM will consider alternatives to the procedures and equipment described in Method 5035A and supplemental IDEM guidance on a site-specific basis.

Similarly, traditional sampling methods may be acceptable for some specific projects initialized before release of the IDEM RCG and utilizing the **Risk Integrated System of Closure** (RISC) as described below.

- Area Screening – When performing default or non-default Area Screening activities for VOCs (as described in the RISC Technical Guide [see reference below], Chapter 3.4.3.1) or an underground storage tank (UST) closure sampling assessment (under 329 IAC 9-6-2.5 and the RISC User's Guide [see reference below], Chapter 3), use Method 5035A in most cases. If information collected is intended to obtain a "clean closure," use Method 5035A to ensure representative results. However, if additional investigations and/or corrective actions are intended, Method 5035A may not be needed for area screening.

- Site Characterization – When conducting investigations to determine the nature and extent of VOC soil contamination, use Method 5035A. If the investigation includes areas of known or suspected contamination, Method 5035A may not be needed as long as the variation in methods agrees with project DQOs. If the leaking underground storage tank (LUST) "Step-Out Procedure" is employed (as described in the RISC User's Guide, Chapter 3.5.1), use Method 5035A when soil samples collected are believed to be below RISC Residential Default Closure Levels for the contaminants of concern (COCs).

- Corrective Action – When conducting soil removal during a UST removal closure or soil excavation, use Method 5035A when the information will be used to verify that the source was removed or there was no release and/or source present (in the case of a UST closure). Collect soil from the excavation at locations prescribed by the IDEM program providing oversight. Generally, remove an additional six inches (6”) of soil to expose soil that is representative of the actual conditions immediately before sampling using Method 5035A.

  Note: The above description does not apply to projects in the Resource Conservation and Recovery Act (RCRA) Corrective Action Program.

- Closure (No-further-action) – When collecting soil samples to confirm soil results meet closure standards, use Method 5035A for all samples sent to a stationary, off-site laboratory for analysis.

- Total Petroleum Hydrocarbons (TPH) – Thorough planning is needed to assure TPH sampling procedures will meet laboratory requirements and project DQOs. Soil samples to be analyzed for unknown petroleum products and gasoline range organics (GRO) should be collected and preserved using Method 5035A to minimize volatilization and biodegradation of the hydrocarbons. For analysis of many mid-range hydrocarbons (diesel range organics [DRO]) and high end hydrocarbons and oils (extended range organics [ERO]) in soil, traditional sample collection methods may be used. When TPH fractionation analysis is to be used to determine a site-specific closure level, use Method 5035A to collect and preserve all soil samples. Likewise, use Method 5035A to collect soil samples for analysis of VOC contaminants of concern. Additional information regarding this issue may be found in Chapter 8 of the RISC Technical Guide.

  Note: Since the RCG does not have screening levels for TPH, the above TPH specifications may not be relevant for current sampling projects.

Sensitive Receptors

If the source is close to receptors or conduits, take special care to ensure representative results by using Method 5035A. Of particular concern are sources near drinking water wells, wellhead protection areas, or ecologically susceptible areas. In these situations it is necessary to detect and define very low levels of contamination (typically on the periphery of a plume) prior to demonstrating site characterization.

Sample Preservation and Holding Time

Sample holding times ranging from 48 hours to 14 days are described in Method 5035A. Implementation of alternative procedures and/or chemical preservatives to extend the maximum holding time may be allowed in some cases, if it can be demonstrated that the concentrations of target analytes in the samples will not be significantly affected.

Common chemical preservatives such as methanol and sodium bisulfate may have effects (dilution or reaction with contaminants of concern, raised detection limits above set action levels, false positives and negatives, etc.) on the samples and thus may not be appropriate for some projects. Sample collection, preservation, and storage options should be selected based on the requirements of the DQOs for the project. Additional information regarding this issue may be found in Appendix A of SW-846 Method 5035A.

Synthetic Precipitation Leaching Procedure (SPLP, SW-846 Method 1312)

Section 9.10 of the RCG allows the use of the Synthetic Precipitation Leaching Procedure (SPLP), SW-846 Method 1312 [**SPLP or Method 1312**] as one alternative to calculating site-specific migration to ground water levels. Method 1312 was released before Method 5035A, and Method 1312 has not been revised to include Method 5035A procedures to minimize loss of VOCs during sample collection and handling prior to extraction. The following items should be addressed when soil and solid waste samples are collected using Method 5035A and extracted using Method 1312 prior to analysis for VOCs:

- Sampling Device/Container – Obtain samples using an appropriate coring device (such as a 25-gram EnCore® type sampler) that is used for collection, transport and storage of the samples with minimal loss of VOCs. Method 1312 typically requires approximately 25 grams of sample in order to prevent headspace in the Zero Headspace Extraction (ZHE) vessel used by the laboratory. The volume of soil (5 grams) obtained using some Method 5035A coring devices is insufficient. Likewise, the 40 mL glass vial container options listed in Appendix A of Method 5035A may not be acceptable due to potential loss of VOCs during transfer of the sample from the container to the ZHE vessel.

- Transport, Preservation, and Holding Time – Transport samples on wet ice at 4 degrees C and deliver samples to the laboratory within 48 hours of collection. Chemical preservation is not permitted prior to SPLP extraction; however, samples received within 48 hours of collection may be frozen on arrival at the laboratory to extend the holding time to 14 days from the date of collection to date of extraction. Frozen samples are then maintained at -10 degrees C and the laboratory documents that the samples were frozen. Once a sample is thawed (to 4 degrees C) the SPLP extraction is performed as soon as possible. After the SPLP extraction has been completed, the holding time for analysis of the leachate is seven days if unpreserved and 14 days if acid preserved by the laboratory performing the SPLP extraction.

- Particle Size Reduction – Section 7.3.6 of Method 1312 describes a procedure for reducing the size of the particles of the sample prior to transferring the sample to the ZHE vessel. Any grinding, cutting, or crushing of the sample prior to extraction may cause loss of VOCs due to volatilization and should be avoided. Samples should be transferred directly from the collection/transport device to the ZHE vessel with as little disturbance as possible.

- Detection Limits – SPLP is not a part of the analytical procedure, and as such is not included in the determination of detection limits. The laboratory maintains the ratio of extraction fluid to sample volume/weight during the SPLP extraction so that established detection limits for the VOC analysis may be maintained. Typically a 20:1 ratio (500 mL fluid to 25 g sample) is employed.

- Laboratory Equipment and Procedures – When planning for sampling, confirm that the laboratory has the required extraction equipment (ZHE device) available and is able to document the procedures described in Method 1312.

Further Information

If you have any additional information regarding this technology or any questions about the evaluation, please contact IDEM Chemistry Services Section at (317) 232-5884. This technical guidance document will be updated as new information is acquired.

Additional References

"Standard Guide for Sampling Waste and Soils for Volatile Organic Compounds," ASTM Standard D 4547, current edition published February 2006, and updates.

"Standard Practice for Collection and Handling of Soils Obtained in Core Barrel Samplers for Environmental Investigations," ASTM Standard D 6640, current edition published May 2005, and updates.

"Remediation Closure Guide," Indiana Department of Environmental Management, March 22, 2012, and updates. **[RCG]**

"Risk Integrated System of Closure: Technical Resource Guidance Document," Indiana Department of Environmental Management, February 15, 2001, and updates. **[RISC Technical Guide]**

"Risk Integrated System of Closure: User's Guide," Indiana Department of Environmental Management, February 15, 2001, and updates. **[RISC User's Guide]**

Method 1312, "Synthetic Precipitation Leaching Procedure" in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, Third Edition, Final Update II, September 1994.

Method 3815, "Screening Solid Samples for Volatile Organics" in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, SW-846, Third Edition, Draft Update IVB; November 2000.

ATTACHMENT C

IDEM's Nonrule Policy Document #WASTE-053NPD, Drilling Procedures and Monitoring Well Construction Guidelines

<table>
<tr><td>INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT</td><td>STATUS:
Effective</td><td>POLICY NUMBER:
WASTE-053-NPD</td></tr>
<tr><td rowspan="3">AGENCY NONRULE POLICY DOCUMENT

SUBJECT:
Drilling Procedures and Monitoring Well Construction Guidelines</td><td colspan="2">AUTHORIZED:
Thomas W. Easterly, Commissioner</td></tr>
<tr><td>SUPERSEDES:
New</td><td>ISSUING OFFICE(S):
Office of Land Quality-Remediation Branch and Science Services Branch</td></tr>
<tr><td>ORIGINALLY EFFECTIVE:
March 17, 2009</td><td>RENEWED/REVISED:</td></tr>
</table>

Disclaimer: *This Nonrule Policy Document (NPD) is being established by the Indiana Department of Environment Management consistent with its authority under IC 13-14-1-11.5. It is intended solely as guidance and shall be used in conjunction with applicable rules or laws. It does not replace applicable rules and laws, and if it conflicts with these rules or laws, the rules or laws shall control. Pursuant to IC 13-14-1-11.5, this policy will be available for public inspection for at least forty-five (45) days prior to presentation to the appropriate State Environment Board, and may be put into effect by IDEM thirty (30) days afterward. If the nonrule policy is presented to more than one board, it will be effective thirty (30) days after presentation to the last. IDEM also will submit the policy to the Indiana Register for publication.*

1. PURPOSE

The purpose of this document is to assist drillers, geologists and contractors who are conducting or evaluating subsurface investigations to be submitted to programs in the IDEM Office of Land Quality (OLQ) Remediation Services Branch. This guidance is applicable only for sites overseen by the OLQ Remediation Services Branch, and not to other IDEM Programs. In particular, programs such as RCRA Subpart C and D (Hazardous and Solid Waste) are governed by other comprehensive rules and guidance. Such programs are specifically excluded from this NPD

2. SCOPE

These procedures for borings and monitoring well installations have been compiled from state statutes and rules IC 25-17.6, IC 25-39, 312 IAC 12, 312 IAC 13, and 329 IAC 9; combined with some guidance specific to the Remediation Services Branch programs. Program specific requirements may also be applicable, and the respective IDEM program should be consulted before drilling. These guidelines are not requirements (unless covered by the state rules cited above), but following this guidance should ensure prompt acceptance of borings and wells by staff during OLQ evaluation. Other procedures may be acceptable if they do not violate state rules, but deviations will be evaluated on a case by case basis. The procedures in this guidance may be applied to sites of all sizes, but variations are more likely to be appropriate at larger and more complex sites.

3. SUMMARY

This Non-rule Policy identifies and clarifies procedures for borings and monitoring well installations, including: drilling methods; the size and use of boreholes; sampling methods; well casing materials requirements; well screen requirements; filter pack and filter seal requirements; grouting material and grouting requirements; finished well casing requirements; well development, drilling and decontamination requirements; the use of licensed water well drillers; well log guidance; well or boring abandonment requirements; and well or borehole plugging procedures. Direct quotations from a rule or statute are in italics.

4. DEFINITIONS

4.1. “Abandon” is to terminate operations of a well for water supply, monitoring, dewatering, or geothermal purposes and restore the site of the well in a manner that will protect ground water resources from contamination. (312 IAC 13-1-2)

4.2. “Annulus” or “Annular Space” means the space between the exterior of the well casing and the natural formation in a drilled well. (IC 25-39-2-3)

4.3. “Bentonite” is clay material composed predominantly of sodium montmorillonite that meets American Petroleum Institute specifications standard 13-A (1985). (312 IAC 13-1-4)

4.4. “Bentonite slurry” is a mixture, made according to manufacturer specifications, of water and commercial grouting or plugging bentonite that contains high concentrations of solids. The term does not include sodium bentonite products that contain low solid concentration or are designed for drilling fluid purposes. (312 IAC 13-1-5)

4.5. “Borehole” is an uncased well or hole drilled or driven to obtain geologic information; or soil, rock, or ground water samples. (312 IAC 13 and IC 25-39-2)

4.6. “Bridge” is a barrier created by any unwanted object or material that prevents the introduction of grouting materials in the borehole or well. (312 IAC 13-1-6) “**Bridging**” is the act of creating a bridge.

4.7. “Coarse grade crushed bentonite” is natural bentonite crushed to an average size range of three-eighths (3/8) to three-fourths (3/4) inches. (312 IAC 13-1-7)

4.8. “Confined aquifer” is an aquifer that contains sufficient hydrostatic head to cause ground water to rise above the upper boundary of the aquifer. (312 IAC 13-1-9)

4.9. “Consolidated Material” is rock, or bedrock.

4.10. “Contamination” is the degradation of natural water quality as a result of human activities. (312 IAC 13-1-10)

4.11. “Direct-push” is a type of drilling where the drill rig uses direct pressure to push a tool instead of augers or a cable tool.

4.12. “Grab sample” is a discrete one–time only sample taken from a borehole.

4.13. “Granular bentonite” is natural bentonite which is ground or crushed to a uniform small size.

4.14. “Grout” is fluid material (composition defined in Part 6.1.8.) poured or injected into a borehole, well, or annular space between the well casing and the borehole, to form an impermeable seal.

4.15. “Grout pipe” is a length of hose or pipe positioned in the annular space of a well, between the well casing and the borehole, used for the introduction of grouting materials (312 IAC 13-1-15). The grout pipe, also known as a tremie pipe, can be used to plug a hole for abandonment.

4.16. “Medium grade crushed bentonite” is natural bentonite crushed to an average size range of one-fourth (1/4) to three-eighths (3/8) inch. (312 IAC 13-1-17)

4.17. “Monitoring well” is a well installed to obtain hydrogeological information or to monitor the quality or quantity of ground water. (312 IAC 13-1-18)

4.18. “Neat cement” is a mixture of ninety-four (94) pounds of cement and no more than six (6) gallons of clean water. Additives designed to increase fluidity may not exceed 5 percent (5%) of the total mixture. (IC 25-39-2-13)

4.19. “Pelletized bentonite” is bentonite which is formed into uniform tablets by a manufacturing process.

4.20 “Thermoplastic pipe” is plastic well pipe made of acrylonitrile butadiene styrene, polyvinyl chloride or rubber-modified polystyrene with standards listed in American Society of Testing and Materials. (312 IAC 13-1-23)

4.21. “Unconfined aquifer” is an aquifer in which the water table forms the upper boundary.

4.22. “Unconsolidated formation” (or unconsolidated material) is geologic material or deposits overlying bedrock, such as sand, gravel and clay. (312 IAC 13-1-24)

5. ROLES

5.1. Consultant: Environmental professional, hired (often by the landowner) to evaluate potential or confirmed site contamination. The consultant is responsible for determining the location of borings and wells, for describing and field screening sampled soil from soil borings, determining well construction, and preparing records, (such as the drilling logs, monitoring well construction diagrams, work plans and reports) to be submitted to OLQ. The consultant is also responsible for explaining deviations from this guidance. The consultant is also responsible for oversight of well development, sampling, and disposal of development and sampling purge water. Many of the above consultant activities are required to be performed by an Indiana Licensed Professional Geologist (LPG), (IC 25-17.6).

5.2. Driller: (or water well driller): Drills soil borings and constructs monitoring wells. “A water well driller shall operate all equipment according to generally accepted standards in the industry. The driller is responsible for initiating, maintaining, and supervising operations and shall take appropriate precautions to prevent damage, injury, or other loss to persons and property at the drilling site.” (312 IAC 13-3-1) The driller is responsible for decontamination of equipment, sending boring logs to the Department of Natural Resources (DNR), and plugging (grouting) borings and wells. The driller must be an Indiana Licensed Water Well Driller. (IC 25-39)

5.3. Land Owner: Owner of land where drilling is being done. Responsible for having borings or wells plugged within one year of abandonment. (IC 25-39-4-6)

5.4. OLQ Project Manager: IDEM staff designated as responsible for coordination and implementation of activities for specific OLQ Remediation Services Branch sites. This staff person gives regulatory guidance and assistance to the consultant and is the primary point of contact at IDEM, receiving telephone calls and reports from the consultant. The project manager prepares and sends OLQ responses to consultant questions and submittals.

5.5. OLQ Site Geologist: IDEM Geologist, serving in the OLQ Science Services Branch, who evaluates geologic aspects of OLQ Remediation Services Branch sites and provides guidance and assistance on general geologic subjects to the OLQ Project Manager, consultant, and driller, as needed. This staff person prepares responses to geologic issues in submitted site reports for OLQ Project Manager.

6. POLICY

DRILLING PROCEDURES AND MONITORING WELL CONSTRUCTION GUIDELINES

6.1. INSTALLATION OF BORINGS AND MONITORING WELLS

6.1.1. DRILLING METHODS

(A) The principles and procedures recommended by the OLQ Science Services Branch for drilling boreholes and installing monitoring wells should ensure that:
 (1) Subsurface materials are not adversely affected.
 (2) Ground water or aquifers are not contaminated or cross-contaminated.
 (3) Continuous and representative formation samples can be collected.
 (4) Placement of the filter pack and annular sealants is adequate.

(B) Drill fluids other than water are to be avoided. However, if they are unavoidable, the consultant for the project should provide the OLQ Project Manager and OLQ site geologist with a rationale for use and an evaluation of the potential impact of drill fluids on the physical and chemical characteristics of the subsurface and groundwater.

(C) To prevent contamination or cross-contamination, all equipment that may encounter contaminated formation materials must be decontaminated prior to drilling each new borehole, and sampling equipment must be decontaminated between sampling intervals (See Part 6.1.13.). Decontamination fluids must be captured, containerized, and properly disposed of, as described Parts 6.1.12. and 6.1.13.

(D) Common drilling methods include:

(1) Hand Augers: This method is commonly used for borings less than fifteen feet deep, or explorations near utility lines.

(2) Solid-Flight Augers: This method should not be used since the auger is solid, and proper soil sampling cannot be conducted. Soil sampling from auger cuttings is not acceptable, because of the churning of the material.

(3) Hollow Stem Augers: Similar to Solid-Flight Augers, however, the hollow center portion allows for the collection of formation samples using sampling devices. The hollow center also allows for the installation of well materials without the possibility of borehole collapse. These augers can not drill into bedrock, but can be used in most unconsolidated materials.

(4) Air Rotary: This method is used mostly for drilling bedrock wells. Given the large volume of air introduced to the hole, it is possible that biodegradation, oxygenation, or vaporization could occur as a result of the drilling. Sampling of wells installed using this method should be postponed until this effect has dissipated.

(5) Air Rotary with Casing Driver: With the addition of a casing driver, air rotary methods can be used in unconsolidated materials.

(6) Direct Push: This is an economical and fast method for drilling soil borings, to obtain cores and groundwater grab samples for screening and characterization, or other one-time sampling events. Monitoring wells set by direct push methods can provide good service in sandy soils. However, the EPA reports high turbidity and trouble in getting adequate sample volume from direct push wells in low permeable geologic settings, and states that direct push wells are not appropriate for all situations. (EPA 540/R-04/005). If a direct push well does not provide sufficient low-turbid water for planned analyses, the well needs to be replaced, usually with a larger diameter, augured well.

(7) Rotasonic: This method is particularly suited for well installation without cross-contamination in thick unconsolidated deposits, cobbles, and heaving sands. It also provides a higher percent core recovery than hollow stem augers; but rotasonic is usually prohibitively expensive for normal site investigations.

(8) Cable Tool Drilling (312 IAC 13-8-3 (k).

(9) Dual-wall Reverse Circulation.

(10) Fluid Rotary (also known as Mud or Water Rotary).

The last three methods presented are seldom used to drill monitoring wells, but may be used in some applications. For a more in-depth description of most of the above methods, consult the USEPA Document “Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells” EPA/600/4-89/034 and ASTM D5092-04 “Standard Practice for Design and Installation of Ground Water Monitoring Wells.”

6.1.2. BOREHOLES

(A) Boreholes, used to sample soils and for one-time-only groundwater grab samples, may be any diameter as long as quality samples can be obtained. However, small diameter cores may not yield sufficient material for field descriptions and laboratory analyses.

(B) Boreholes for monitoring wells should be drilled by methods which will remove as much of the formation material as practicable for core logging. Methods which compact or push most of the formation materials to the side of the boring should be avoided due to the compaction and alteration of the formation.

(C) “A monitoring well installed by the rotary or auger drilling method shall have a borehole with a diameter at least two (2) inches greater than the nominal diameter of the casing.” (312 IAC 13-8-3(j)).

(D) Direct push borings need to be large enough for their intended purpose(s), and to allow for proper abandonment of the borehole afterwards.

Please refer to state rule 312 IAC 13-8-3 for additional information.

6.1.3. SAMPLING AND ANALYSES

(A) Continuous downhole samples of the unconsolidated and consolidated materials should be collected in all borings. Monitoring wells installed within five feet of a previously made boring do not have to be sampled if adequate samples and a log from the nearby boring were obtained. For well clusters, continuous samples should be collected from the surface to the base of the deepest well. Samples for description or laboratory analyses should be as undisturbed as practicable, so auger cuttings are not acceptable. Sampling should conform to applicable OLQ Science Services Branch program guidance.

(B) If direct push methods are used for sampling in areas that are, or are suspected to be contaminated, well casings or double walled sampling tubes should be used to reduce the potential for sample sloughing or sidewall cutting.

(C) For borings installed to delineate the nature and extent of contamination, all soil intervals should be field screened (if that is possible for the contaminant of concern) using appropriate, properly calibrated instrumentation suitable for detecting the contaminant present. Most current field screening instruments are useful for qualitative measurements but are not sufficiently accurate to define the extent of contamination, which should be done using laboratory analyses. At a minimum, samples for laboratory analysis should be taken from the interval exhibiting the highest field screening results (or directly above the water table if all readings are low). Other locations may be appropriate where supported by specific reasons identified by the consultant geologist.

(D) For borings installed to delineate the extent of contamination, vertical sampling should continue until the contamination is no longer encountered, not just to a pre-determined depth or the water table. Confirmatory laboratory samples should be taken at the base of each boring, or below the contamination, to define the vertical extent of contamination.

(E) Many direct sensing devices are capable of being mounted on a direct-push system. These systems may provide useful data and an efficient delineation of contaminants. The use of such systems should include at least three (3) ground-truth or calibration borings.

(F) Monitoring wells should not be used for applications of remediation products.

(G) Reports and work plans submitted to the OLQ Project Manager should specify all procedures regarding sampling and testing.

Please refer to state rules 329 IAC 9-5-5.1, 312 IAC 13-2-6 and 312 IAC 13-8-3 for additional information.

6.1.4. CASING MATERIALS

(A) “A monitoring well shall be equipped with casing. The composition, wall thickness and nominal diameter of the casing shall be sufficient to allow the well to be used for its intended purpose.” (312 IAC 13-8-3(b))

(B) “Monitoring well casing shall be new first class material that meets the American Society of Testing Materials (ASTM) standards ASTM A-120 (1984) or ASTM A-53 (1987) or the American Petroleum Institute (API) standards API-5A or API-5L (1987). Thermoplastic pipe shall comply with ASTM F- 480 (1981). Well casing shall be as follows:

(1) Clean and free of rust, grease, oil, or contaminants and composed of materials that will have minimal impact on the quality of a water sample.

(2) Centered in the borehole and free of obstructions so monitoring devices can be lowered into the well.” (312 IAC 13-8-3(c))

The monitoring well casing should also be:

(3) Composed of materials which will not be degraded or react with the contaminants of concern.

(4) Sealed with commercial o-rings and mechanically fastened, or threaded together without the use of glues, oils, or joint compound.

Please refer to state rules 312 IAC 12-3-1 and 312 IAC 13-8-3 for additional information.

6.1.5. WELL SCREEN

(A) "A monitoring well screen shall be composed of materials that will not corrode or react with chemicals found in the ground water at the site. (312 IAC 13-8-3(d))

(B) "The well screen slots shall not be hand cut and shall be sized to retain at least ninety percent (90%) of the grain size of the introduced filter pack. (312 IAC 13-8-3(d))

(C) The screen should conform to the casing material standards in Part 6.1.4.

(D) Screen lengths should be not less than two feet and not greater than ten feet. Shorter screens may be used in nested wells, or for sampling discrete zones. Nonstandard wells should be discussed with OLQ before installation.

(E) Screen placement should be based on the type(s) and phase(s) of contamination, and aquifer type.
- (1) If light non-aqueous phase liquids (LNAPLs), are the contaminants of concern, then the well screen should be placed at the top of the aquifer.
- (2) If dense non-aqueous phase liquids (DNAPLs) are the contaminants of concern, then nested wells should be installed, extending from the top of the aquifer to slightly below the base of the aquifer. If DNAPLs are suspected, great care needs to be taken not to breach confining layers, which could spread the contamination to a deeper aquifer.
- (3) In an unconfined aquifer, and if the contaminants of concern are LNAPLs, or disseminated LNAPL, the well screen should be set straddling the water table, with sufficient screen above the water table to allow for seasonal water table fluctuations to remain within the screened interval.
- (4) If the aquifer is confined, the screen should be set to detect the type of contamination present. The presence of all reportedly confined aquifers should be verified by site data, which may include:
  - (a) An obvious and continuous, dry confining layer.
  - (b) Wells with screens set above the supposed confined aquifer that exhibit a definite head difference from the confined aquifer.
  - (c) A separate water bearing zone above the confined aquifer.
- (5) Variations from the above recommendations should be supported by specific reasons from the consultant for the project and should be discussed before installation with OLQ.

Please refer to state rule 312 IAC 13-8-3 for additional information on screen materials and slotting. Additional information on screen placement may be found in EPA/600/4-89/034.

6.1.6. FILTER PACK

(A) "*The introduced filter pack shall: (1) be properly sized and graded* …" (312 IAC 13-8-3(d)), which OLQ interprets to mean that the filter pack should not allow silt and clay-sized sediments to clog the well screen.

(B) Filter pack material should consist of inert sand or gravel and comply with the following:
(1) A uniform grain size should be chosen which is three to five times the average fifty percent retained size of the formation material, unless this filter pack grain size would impede adequate flow of ground water into the well. Should this happen, a filter pack grain size should be used that allows ground water flow into the well and prevents silt infiltration.
(2) Natural, granular material, which will not clog the well screen, may be an acceptable constituent of the filter pack if slump is unavoidable.
(3) The upper one to two feet of the filter pack should be of fine, inert sand to prevent infiltration of seal materials.

(C) Pre-packed well screens may be used, if the packing material is sized correctly.

(D) The filter pack should be emplaced without bridging.

(E) The filter pack should extend at least one foot but "not extend more than two feet above the top of the screen or the uppermost water bearing unit to be monitored." (312 IAC 13-8-3(d))

(F) For shallow monitoring wells with the screen less than three feet below the surface, it may not be possible to install a full-length filter pack or seal. If so, the filter pack should extend just above the screened interval, and the well should be grouted to the surface or surface seal.

(G) "A monitoring well installed by the direct push method must be constructed as follows:
(1) The well shall be equipped with a pre-packed well screen. (See subdivision C, above.)

(2) A sand grout barrier shall:
(a) Be placed directly above the pre-packed well screen in the annulus between the well casing (riser pipe) and the borehole wall as the probe rods are retracted;
(b) Be installed to prevent bridging; and
(c) Extend not more than two (2) feet above the top of the pre-packed well screen." (312 IAC 13-8-3(l))

Please refer to state rule 312 IAC 13-8-3 for additional information.

6.1.7. FILTER PACK SEAL

(A) "A filter pack seal of bentonite slurry or granular, pelletized, medium grade, or coarse grade crushed bentonite, may be placed in the annulus directly above the filter pack or sand grout barrier." (312 IAC 13-8-3(e))
(B) "A filter pack seal may be installed under subsection (A) directly above the sand grout barrier." (312 IAC 13-8-3(l))
(C) "The filter pack seal shall:
(1) Be installed to prevent bridging; and
(2) Not extend more than two (2) feet above the filter pack or sand grout barrier." (312 IAC 13-8-3(e))
(D) A bentonite filter pack seal should be hydrated with clean water if installed above the water table.

6.1.8. WELL GROUTING MATERIALS

(A) "Granular bentonite may be used to grout a monitoring well if:
(1) The diameter of the borehole is four (4) inches or larger than the nominal diameter of the well casing; and"
(2) The "well is no more than twenty-five (25) feet deep.
(B) Except as provided in subdivision [C], the annulus of the monitoring well shall be pressure grouted with neat cement or a bentonite slurry or be grouted with pelletized, medium grade, or coarse grade crushed bentonite from the top of the filter pack or filter pack seal under [Part 6.1.7.] (for a well installed in unconsolidated materials) or the bottom of the well casing (for a well penetrating bedrock) to the ground surface or to within one (1) foot of the ground surface if a flush mounted protective cover pipe is installed if:
(1) The diameter of the borehole is four (4) inches or larger than the nominal diameter of the well casing; and"
(2) The "well is not more than one hundred (100) feet deep.
(C) The annulus of the monitoring well shall be pressure grouted with neat cement or a bentonite slurry from the top of the filter pack or filter pack seal under Part 6.1.7.for a well installed in unconsolidated materials) or the bottom of the well casing (for a well penetrating bedrock) to the ground surface or to within one (1) foot of the ground surface if a flush-mounted protective cover pipe is installed where either:
(1) The diameter of the borehole is less than four (4) inches larger in diameter than the nominal diameter of the well casing; or
(2) The well is more than one hundred (100) feet deep." (312 IAC 13-8-3(j))
(D) For a monitoring well installed by the direct push method, "The remaining annulus between the well casing (riser pipe) and probe rods shall be pressure grouted with neat cement or a bentonite slurry from the top of the sand grout barrier or filter pack seal to:
(1) If a flush-mounted protective pipe is installed, within one (1) foot of the ground surface; or
(2) The ground surface." (312 IAC 13-8-3(l))
(E) For a monitoring well installed by the direct push method, "The probe rods shall be pulled during installation of the grout material." (312 IAC 13-8-3(l))
(F) Well cuttings should not be used for grout. "Grouting materials shall consist of:
(1) Neat cement with no more than five percent (5%) by weight of bentonite additive;
(2) Bentonite slurry (which can include polymers designed to retard swelling);
(3) Pelletized, granular, medium grade crushed, or
(4) Coarse grade crushed bentonite." (312 IAC 13-5-1(b))

OLQ interprets the rules quoted in Part 6.1.7. to mean that pelletized, granular, medium grade crushed, or coarse grade crushed bentonite can be used only if the diameter of the borehole is four (4) inches or larger than the nominal diameter of the well casing. Otherwise, cement or bentonite slurries must be used, as stated in the rule (312 IAC 13-8-3). If the consultant wishes to use other grouting materials, they should contact the OLQ site geologist or check the rules cited above.

6.1.9. *WELL GROUTING*

(A) "This section applies if neat cement or a bentonite slurry is used for grouting. The cement or slurry shall be pumped into place from the bottom of the annular space upward in a continuous operation with a grout pipe or the well casing using the positive displacement method.

(B) Grouting material, other than neat cement or bentonite slurry, shall be introduced in a manner to prevent bridging of the annulus between the outside of the well casing and the borehole.

(C) A borehole annulus shall be grouted upon the earlier of the following:
(1) Within twenty-four (24) hours after the installation of the well casing.
(2) Before drilling equipment is removed from the site." (312 IAC 13-5-1(c), (d), and (e))

6.1.10. FINISHED WELL CASING

(A) Monitoring well casing that extends above the ground surface should be installed as follows:
(1) Except in areas where the well may be susceptible to damage, "the finished well casing:
(a) Shall extend at least two (2) feet above the ground level and
(b) If located in a flood plain, must be:
(i) At least two (2) feet above the elevation of the regulatory flood or
(ii) Equipped with a watertight cap.
The monitoring well shall be located to protect against surface water ponding, and earthen materials, neat cement, or concrete shall be placed around the well casing to drain surface water from [around] the well." (312 IAC 13-8-3(f))
(2) "A monitoring well, located where the casing is susceptible to damage, shall be equipped with a protective outer pipe consisting of a metal casing having a diameter large enough to allow easy access to the well. The protective cover pipe shall be firmly anchored in the ground. Additional protective devices, for example, brightly colored posts around the well, are required where construction equipment or vehicular traffic could damage the well." (312 IAC 13-8-3(g))
(3) "A monitoring well must be equipped with a locking cap or cover to prevent unauthorized access. The locking cap may be placed:
(a) Directly on the well casing, or
(b) If required under subsection [A2, above], on the protective cover pipe." (312 IAC 13-8-3(h))
(4) All monitoring wells should be kept locked at all times except during sampling.

(B) "A monitoring well installed so that the top of the well casing is finished at an elevation below the ground surface shall be equipped with a watertight cap. The top of the well casing shall terminate at a depth no greater than one (1) foot below the ground surface and shall be located in a flush-mounted protective cover pipe. The flush mounted protective cover pipe shall include each of the following:
(1) A watertight one (1) piece or continuous welded metal casing:
(a) At least one (1) foot long; and
(b) Having a nominal diameter at least four (4) inches greater than the nominal diameter of the monitoring well. The casing shall be flanged for greater stability if installed in a location likely to be subject to vehicular traffic.
(2) A concrete ground surface seal, if an impervious surface, for example, concrete or asphalt, is not present. The ground surface seal shall be installed and extend not more than three (3) feet below the ground surface.
(3) A sealed lid that is no more than one-half (½) inch higher than the elevation of the ground surface. The sealed lid shall be as follows:

(a) Of a quality to withstand vehicular traffic if installed in a location likely to be subject to vehicular traffic.
(b) Clearly marked with the words “MONITORING WELL” or “MONITOR” and
(c) Also display the words “DO NOT FILL.” (312 IAC 13-8-3(i))

(C) A monitoring well installed so that the top of the well casing is finished at an elevation below the ground surface should be locked as in Part 6.1.10. (A) (3) and (4), above.

6.1.11. WELL DEVELOPMENT

(A) A monitoring well shall be developed following installation and before water samples are collected. This development shall be accomplished to produce water that is as free as practicable from the following:
(1) Sediment.
(2) Drill cuttings
(3) Drilling fluids.

(B) If a well is installed to monitor ground water quality, the well shall be adequately developed to produce a representative sample of the water quality.” (312 IAC 13-8-3(m))

(C) Wells should be developed at least twenty-four hours before sampling takes place.

(D) Well development should be confirmed by decreasing turbidity.

6.1.12. DRILLING FLUIDS, CUTTINGS, AND DEVELOPMENT WATER

(A) “Contaminated drill cuttings, fluids, and surge and wash waters produced in the drilling and development of a monitoring well shall be collected and contained to:
(1) Prevent contamination of the area; and
(2) Protect persons who might otherwise come in contact with these materials.” (312 IAC 13-8-3(n))

OLQ interprets these requirements to include water produced during well or aquifer tests, and purge water for sampling. Please sample and properly dispose of all known or suspected contaminated material, according to applicable rules (IC 13-30-2-1).

6.1.13. DECONTAMINATION

“Monitoring well construction and development equipment that comes in contact with contaminated water or contaminated geologic materials shall be cleaned with high pressure hot water or steam, using inorganic soap or other suitable solvents, and rinsed thoroughly. Contaminated fluids or wash waters shall be collected and contained so that the result is not contamination of the area or a hazard to individuals who may come in contact with these materials.” (312 IAC 13-8-3(o))

OLQ interprets this to mean that all materials known or suspected to be contaminated must be sampled and properly disposed. Drilling equipment should be decontaminated between drilling each hole. (IC 13-30-2-1)

6.1.14. USE OF LICENSED WATER WELL DRILLER

All monitoring wells shall be installed by an Indiana licensed water well driller as required by IC 25-39-3. This includes any environmental borings, installed by any powered drill rig. The name and license number of the driller should be included on all boring and well logs.
Please refer to state rule 312 IAC 13-3 and Indiana Code IC 25-39-3 for additional information.

6.1.15. INFORMATION NEEDED FOR OLQ REMEDIATION SERVICES BRANCH PROJECTS

(A) All information should be typed. Illegible logs do not convey information.

(B) Diagrammatical borehole drilling logs should be of similar scale and include the following information:
(1) The borehole identification label.
(2) The date of drilling or installation.
(3) The method of drilling.
(4) The name and license number of the driller and (if applicable) the name and license number of the consultant geologist.
(5) The borehole diameter.

(6) The method of sampling consolidated material and unconsolidated material.
(7) The type of drill fluids, fluid additives, or lubricants other than water, that have been used.
(8) Penetration measurements (if available), such as hammer blow counts, penetrometer measurements, or other acceptable penetration measurements.
(9) The sample recovery measured to the nearest one-tenth (.10) foot.
(10) Consolidated material and unconsolidated material field descriptions, including the following information:
(a) Lithology and sedimentology.
(b) Mineralogy.
(c) Degree of moisture.
(d) Evidence of contamination, such as field screening, odors or staining
(e) Color as referenced from soil color charts such as the Munsell soil charts
(f) Grain size and textural classification of unconsolidated samples as referenced from the United States Department of Agriculture or Unified textural classification charts. Consolidated samples should be described using accepted geological classification systems and nomenclature. The classification systems used should be noted on the logs.
(g) Any other physical characteristics of the consolidated material and unconsolidated material such as fracturing, solution features, anthropogenic materials, or pedologic characteristics.
(11) Distance to, and depth of, water bearing zones, measured to the nearest one-hundredth (0.01) foot.
(12) Location information sufficient to permit the boring or well to be found on site. Acceptable methods include a scaled map, UTM coordinates, state plane coordinates, etc.
(13) Location (depth) of all samples collected.

(C) Diagrammatical construction and design diagrams of all ground water monitoring wells should also include the following information:
(1) The composition of well and protective casing materials.
(2) The type of joints and couplings between well casing segments.
(3) The elevations of the top of the well casing and the ground surface, surveyed to the nearest one-hundredth (0.01) foot, and referenced to mean sea level.
(4) The diameter of well casing and borehole.
(5) The elevation of the bottom of the borehole and the depth of the borehole.
(6) The screen slot size and type.
(7) The depth and elevation range of the screened interval.
(8) The screen length, measured to the nearest foot.
(9) Methods of installation of the annular fill.
(10) The elevation range and the depth of the filter pack.
(11) The grain size and composition of all filter pack materials and the fifty percent (50%) retained size of the formation material used to determine filter pack materials.
(12) The elevation and depth range of the bentonite seal above the filter pack.
(13) The composition of annular fill.
(14) The elevation range, depth range, and thickness of annular fill.
(15) The composition and design of the surface seal.
(16) The design and composition of materials used for the protection of the well casing.

Please refer to state rule 329 IAC 9-5-5.1 for additional information. Please note that a report, containing DNR-specific reporting requirements, must be sent to DNR for each well installed, per 312 IAC 13-2-6.

6.2. ABANDONMENT OF BORINGS AND MONITORING WELLS

6.2.1. TIMEFRAME

(A) “A well that is drilled after December 31, 1987, and not equipped with casing [i.e. an open borehole] must be plugged by the driller within seventy-two (72) hours after drilling is completed.” (IC 25-39-4-4 and 312 IAC 13-10-2(d))

(B) "The owner of land upon which is situated a well that is abandoned after December 31, 1987, must have the well plugged by a water well driller within one (1) year after it is abandoned." (IC 25-39-4-6)

Please refer to state rule 312 IAC 13-10-2 and Indiana Code IC 25-39-4 for additional information.

6.2.2. ABANDONMENT

(A) Boreholes and wells "shall be plugged with an impervious grouting material to prevent the migration of materials or fluids in the well and the loss of pressure in a confined aquifer." (312 IAC 13-10-2(c)) This means that the well screen and casing are completely filled with impervious grouting material.

(B) Upon abandonment, a written notice of permanent abandonment, referencing the abandonment date, boring or well identification, and location, must be provided to DNR within thirty days after plugging is completed. (312 IAC 13-10-2(f))

(C) Work plans, QAPPS, or CAPS written for OLQ programs should include specifics on planned abandonment procedures and schedules.

(D) Borehole and well abandonment must be performed by an Indiana licensed well driller. (IC 25-39-4)

Please refer to state rule 312 IAC 13-10-2 and Indiana Code IC 25-39-4 for additional information.

6.2.3. PLUGGING PROCEDURES

(A) "A cased or uncased monitoring well shall be plugged from the bottom of the well or borehole to the ground surface with a:
(1) bentonite slurry; or
(2) pelletized or coarse grade crushed bentonite." (312 IAC 13-10-2(e)(6))

(B) Bentonite slurries shall be pumped into place in a continuous operation with a grout pipe introducing the plugging material at the bottom of the [boring or] well and moving the pipe progressively upward as the well is filled." (312 IAC 13-10-2(e) (6)) Displaced water must be contained and properly disposed of in the same manner as Part 6.1.13.

(C) "Plugging materials other than bentonite slurry shall be installed in a manner to prevent bridging of the well or borehole. The well or borehole shall be measured periodically throughout the plugging process to ensure that bridging does not occur." (312 IAC 13-10-2(e)(2))

7. REFERENCES

IC 25-39, IC 13-30, 305 IAC, 312 IAC 12, 312 IAC 13 and 329 IAC 9

USEPA, March 1991, Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells, EPA/600/4-89/034.

USEPA, August 2005, Groundwater Sampling and Monitoring with Direct Push Technologies, EPA 540/R-04/005.

ASTM, March 2004, Standard Practice for Design and Installation of Ground Water Monitoring Wells, D5092-04.

8. SIGNATURES

Thomas W. Easterly, Commissioner, Indiana Department of Environmental Management	10/14/2008 Date
Bruce H Palin Assistant Commissioner, Office of Land Quality	9/26/08 Date
Robert Keene Assistant Commissioner, Office of Legal Counsel	9-26-08 Date

This policy is consistent with agency requirements.

Indiana Department of Environmental Management Quality Assurance Program Planning and Assessment	10/24/08 Date

ATTACHMENT D

Groundwater Monitoring Form

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID

Project #

Sample ID

Project ID

Sample Collector(s)

PM

Well Depth	feet	Screened Interval:	1 Well Volume:
			3 Well Volumes:
Water Level	feet		TOC Elevation:
		Pump Depth in Well:	SWL Elevation:
			Well Diameter:
Water Column	feet		Well Material:

WELL PURGE INFORMATION

Purge Method:

Total Volume Purged (gallons):

Decontamination Procedure: Micro+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): **1"** = 0.041 **2"** = 0.163 **4"** = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance	Color:	Clear	Brown	Gray	Other:	**Sample Date** / /
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	**Sample Time**
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation

REMARKS/COMMENTS

ATTACHMENT E

IDEM Technical Guidance Document The Micro-Purge Sampling Option

TECHNICAL GUIDANCE DOCUMENT

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

The Micro-Purge Sampling Option

www.idem.IN.gov

Mitchell E. Daniels, Jr. — **Governor**

Thomas W. Easterly — **Commissioner**

100 N. Senate Ave., Indianapolis, IN 46204

Toll Free: (800) 451-6027

Guidance Created: June 3, 1998
Revised: November 3, 2009
Reformatted: June 6, 2012

Notice

The Technology Evaluation Group (TEG) completed this evaluation of *The Micro-Purge Sampling Option* based on professional expertise and review of items listed in the "References" section of this document. The criteria for performing the evaluation are generally described in the IDEM OLQ technical memorandum, *Submittal Guidance for Evaluation of Remediation Technologies*.

This evaluation does not verify the effectiveness of the sampling technique in conditions not identified here. Mention of trade names or commercial products does not constitute endorsement or recommendation by the IDEM for use.

Background

Most of today's well purging methods were developed during studies of water supply wells in the 1960's and early 1970's (Powell and Puls, 1997). The studied wells were usually steel-cased with screens set below the top of the water table, and they were analyzed for inorganic water quality parameters.

The procedures used for sampling the water supply wells called for removing about three well volumes of water before sampling, because all the water in a well was thought to be "stagnant", and not representative of water in the aquifer. This purging or removal of the "stagnant" water was deemed necessary before taking "fresh" samples. These procedures have since been carried over into the sampling of groundwater monitoring wells.

Problems Encountered

Traditional purging methods do present problems such as:

- Excessive agitation resulting in volitalization and degassing, which gives erroneous results;

- If the well is purged dry (common in Indiana's low permeable areas) the recharge water cascading through the sand filter pack can lose up to 70% of volatile organic compounds (McAlary and Barker, 1987), and bias metals analyses (Puls and Powell, 1992);

- Preferential recharge from more porous layers, biasing the sample;

- Increased turbidity from the disruption of the sand pack and surrounding soils;

- The large amount of time and effort, resulting in increased labor expense; and

- Disposal of large volumes of contaminated purge water at considerable handling expense, and some risk of additional spills.

Studies to determine actual well flow patterns, including direct observation of colloidal suspensions and dyes in wells, have changed previously held dogma (Kearl, Korte and Cronk, 1992; Powell and Puls, 1993). Multiple studies have shown that while the water above and below a well screen may be stagnant, the water actually in the screened section flows across the well with no significant mixing of water in the screened interval with the stagnant water above or below. This holds true even for wells completed in low permeable materials (Robin and Gillham, 1987).

Therefore, a sample taken from the screened area only (excluding stagnant layers above and sediments below the screen) should be of "fresh" water, representative of the aquifer. Purging, with its attendant problems, may not be necessary. Sediments below the screen can be avoided by restricting the depth of the sampling device. Stagnant water in the casing above the well screen is much more difficult to avoid, but dedicated pumps or careful, slow pump insertion will minimize mixing.

Research and testing of sampling procedures have focused on improving quality and the ease of sampling. Micro-purge, or Low-Flow, sampling has been the most successful new approach. It involves using an in-well pump, not to remove a set volume of water, but to purge water at very low pumping rates (0.1 - 1.0 L/min) just until measured water characteristics exhibit steady-state conditions, showing that the water is being drawn from the aquifer. The most useful parameters are turbidity, dissolved oxygen, and oxidation-reduction potential. Parameters of less value, but often measured, are temperature, pH, and specific conductance (EPA/540/S-95/504).

Advantages

Micro-Purging has numerous advantages over conventional bailing or high speed pumping:

- Samples are much more consistent,
- Sample artifacts are minimized,
- Less operator variability,
- Less time sampling overall,
- Less expensive,

- Less purge water to dispose of (95% less - Serlin & Kaplan, 1996),
- Much less stress on the formation, and
- Filtration eliminated due to marked decrease in turbidity.

Limitations

The disadvantages are:

- Higher capital cost,
- More set-up time,
- Additional equipment, and
- Additional training needed.

Conclusion

The improvements in sample quality, particularly for metals analyses, are well documented (Powell & Puls 1997, EPA/540/S-95/504) and micro-purge sampling is allowed in most states. The EPA has approved its use (EPA/540/S-95/504) and several Regions (I, VIII, and IX) have drafted standard operating procedures for micro-purge sampling. These sampling procedures have been approved and used successfully at many Indiana sites.

The use of micro-purge sampling continues to have immense benefits to Indiana. Much of this state is covered with low permeable soils, in which purging is difficult or impossible without running the wells dry. This costs more time waiting for recharge and yields biased samples. Besides the money and time saved, the improvement in data consistency, accuracy and repeatability is also a bonus, particularly when the public's health is involved.

In one Indiana case study, IDEM approved micro-purge sampling on a site specific basis for a RCRA landfill in Indiana. The sample results for this site, plagued by extreme turbidity, have significantly improved over previous sampling, with turbidity dropping from over 40,000 nephelometric turbidity units (NTUs) to 6 or less. (Weaver, 1997) Additional case study information can be found in the Reference documents, and in Remediation files.

The Office of Land Quality (OLQ), Science Services Branch has evaluated research and USEPA guidance on micro-purge (or low-flow) sampling; and concluded that this methodology can provide more consistent and reliable data than traditional methods, with a significant savings in time, money, and waste. Accordingly, micro-purge sampling can be used as an optional sampling method, <u>if</u> the requirements below are met.

This document is not a complete outline of sampling procedures; for that refer to USEPA EPA/540/5-95/504 or EPA groundwater sampling guidance at http://www.epa.gov/tio/tsp/download/gw_sampling_guide.pdf. This memorandum lists the various requirements or specifications requested by OLQ.

Equipment

- Down-hole bladder or centrifugal pumps must be used. Peristaltic pumps may be used only if volatile organic compounds are not on the list of contaminants of concern. Inertial pumps may not be used.

- It is impossible to perform low-flow sampling with a bailer. Inertial lift devices and high flow rate pumps may not be used. Down-hole, low-flow rate pumps must be used.

- A multi-probe, in-line flow cell, preferably transparent (to detect particulate build-up) must be used. The design of the flow cell must prevent air bubble entrapment during use. The types of flow cells and multi-probes used must be specified in the report, as well as information on how often the multi-probes were calibrated.

- Tubing used should be small diameter (1/4 or 3/8 inch) Teflon or Teflon-lined polyethylene. PVC, polypropylene, or polyethylene tubing should only be used for samples restricted to inorganic analyses. Stainless steel tubing may be used for organics, but not metals.

Sampling

- The monitoring well must be permanent, properly constructed, and developed (Indiana Water Well Drilling Rules 312 IAC 13).

- The water table must be below the top of the well screen.

- A dedicated, submersible pump is recommended. If a dedicated pump is not feasible, then the tubing used for each well should be dedicated and cut to length for that well. The use of a portable pump will require a longer purge time for stabilization. It must be lowered into place as slowly as possible to prevent mixing or surging of the well.

- The midpoint of the saturated screen is usually the optimum depth for the pump intake, but other depths may be used to target specific zones, such as maximum flow layers or zones of high chemical concentrations. Pump intakes must not be so close to the surface that the water level may be pulled below the intake. The pump intake should also be at least two feet above the bottom of the well to preclude excess turbidity from the well bottom. The site sampling and analysis plan must provide detailed information outlining why, how and where each pump intake depth was selected.

- The pump should not be raised or lowered while taking samples.

- A depth gauge must be used during purging to take continual water level readings. Drawdown must be held to less than 0.3 foot during purging. During initial pump start-up, drawdown may temporarily exceed this, before recovery. The water level readings must be recorded and submitted in the sampling report.

- If the water level is pulled down to the pump intake, all concurrent attempts at sampling cease for the well and alternative procedures should be prepared to prevent this from happening during the next sampling period.

- The pump should be started at the lowest flow volume, and adjusted higher as long as the maximum drawdown is not exceeded. Typical extraction volumes are 100 ml/min to 300 ml/min. Volumes may approach 1.0 L/min in very highly permeable soils, but should not exceed this.

- The parameters normally measured for stability (listed in increasing order of sensitivity) are pH, temperature, specific conductivity, oxygen-reduction (redox) potential, dissolved oxygen (DO) and turbidity. Not all parameters may be used for each site, but at least one of the last three listed must be used. All measurements except turbidity must be made using a multi-probe, in-line flow cell.

- The frequency of measurements will depend on the rate of sampling, but should generally be on the order of three to five minutes. Stability will be achieved when three consecutive readings do not vary more than ± 10% for turbidity and DO, ± 3% for conductivity and temperature, ± 10 microvolts for redox, and ± 0.1 for pH. The stability data must be provided to OLQ in the sampling report.

- If, during purging, the turbidity readings increase, this indicates that the well is being re-developed, and the pumping rate should be lowered. Turbidity may be naturally high in some formations, but should stabilize at or below 5 NTU. If this does not happen, the well should be re-developed. If the problem persists, other forms of sampling should be used.

- If the well yield (recharge rate) is lower than the lowest extraction rate and the 0.3-foot maximum drawdown cannot be met, no-flow (or passive) sampling can be used. Permission must be obtained from the IDEM program manager before this option is used, and it must be noted in the sampling plan.

- The sampling methodology and procedures must be detailed in the sampling section of each corrective action plan and progress report. The procedures must be approved by the IDEM program manager before sampling commences.

Further Information

If you have any additional information regarding this technology or any questions about the evaluation, please contact Bob Sonnefield, Senior Geologist, at (317) 234-4688 or by e-mail at rsonnefi@idem.IN.gov. This technical guidance document will be updated periodically, or if new information is acquired.

References

Kearl, P.M., Korte, N. E. and Cronk, T. A. 1992. Suggested modification to ground water sampling procedures based on observations from colloidal borescope. Ground Water Monitoring Review 12, no. 2, pp 155-161.

McAlary, T. A. and Barker, J. F. 1987. Volitalization losses of organics during ground water sampling from low-permeability materials. Ground Water Monitoring Review 7, no. 4, pp. 63-68.

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Serlin, C. L. and Kaplan, L. M. 1996. Field comparison of micropurge and traditional ground water sampling for volatile organic compounds. Proceedings of the Petroleum Hydrocarbons and Organic Chemical in Ground Water Conference, National Ground Water Association, Westville, OH, pp 177-190.

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U. S. EPA Region IX 1995. Use of Low-Flow Methods for Ground Water Purging and Sampling: An Overview. 4 p.

U. S. EPA Region VIII 1994. Standard Operating Procedure for Well Purging. SOP #4.1, Revision 0, 22 p.

Weaver, T. 1997. Case History: Low-Flow Rate Sampling at a RCRA Facility. IDEM Internal Memo, 4 p.

ATTACHMENT F

Soil Gas & Indoor Air Sampling Data Sheet

Soil Gas & Indoor Air Sampling Data Sheet

Project Number/ID: ______________________ **Date:** ______________________

Sampler: ______________________

Location ID	Sample ID	Canister ID	Canister Serial Number	Regulator Serial Number	Tubing Length/Diameter	Volume Purged (cc)	Starting Vacuum (in. Hg)	End Vacuum (in. Hg)	Start Time	End Time

Notes:
1 in^3 = 16.387 cc's
$v = \pi r^2 h$

ATTACHMENT G

Standard Operating Procedure: Installation and Extraction of the Vapor Pin ™

Standard Operating Procedure
Installation and Extraction of the Vapor Pin™

May 20, 2011

Scope:

This standard operating procedure describes the installation and extraction of the Vapor Pin™[1] for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin™ for the collection of sub-slab soil-gas samples.

Equipment Needed:

- Assembled Vapor Pin™ [Vapor Pin™ and silicone sleeve (Figure 1)];
- Hammer drill;
- 5/8-inch diameter hammer bit (Hilti™ TE-YX 5/8" x 22" #00206514 or equivalent);
- 1½-inch diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch diameter bottle brush;
- Wet/dry vacuum with HEPA filter (optional);
- Vapor Pin™ installation/extraction tool;
- Dead blow hammer;
- Vapor Pin™ flush mount cover, as necessary;
- Vapor Pin™ protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel.

[1]Cox-Colvin & Associates, Inc., designed and developed the Vapor Pin™; a patent is pending.

Figure 1. Assembled Vapor Pin™.

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch diameter hole at least 1¾-inches into the slab.

4) Drill a 5/8-inch diameter hole through the slab and approximately 1-inch into the underlying soil to form a void.

5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of Vapor Pin™ assembly into the drilled hole. Place the small hole located in the handle of the extraction/installation tool over the Vapor Pin™ to protect the barb fitting and cap, and tap the Vapor Pin™ into place using a

dead blow hammer (Figure 2). Make sure the extraction/installation tool is aligned parallel to the Vapor Pin™ to avoid damaging the barb fitting.

Figure 2. Installing the Vapor Pin™.

For flush mount installations, unscrew the threaded coupling from the installation/extraction handle and use the hole in the end of the tool to assist with the installation (Figure 3).

Figure 3. Flush-mount installation.

During installation, the silicone sleeve will form a slight bulge between the slab and the Vapor Pin™ shoulder. Place the protective cap on Vapor Pin™ to prevent vapor loss prior to sampling (Figure 4).

Figure 4. Installed Vapor Pin™.

7) For flush mount installations, cover the Vapor Pin™ with a flush mount cover.

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the Vapor Pin™ (Figure 5).

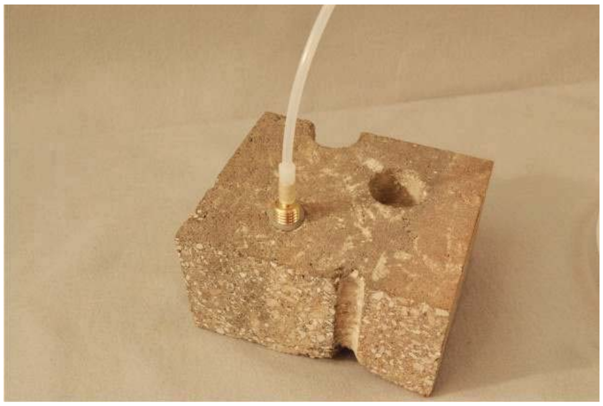


Figure 5. Vapor Pin™ sample connection.

10) Conduct leak tests [(e.g., real-time monitoring of oxygen levels on extracted sub-slab soil gas, or placement of a water

dam around the Vapor Pin™) Figure 6]. Consult your local guidance for possible tests.

Figure 6. Water dam used for leak detection.

11) Collect sub-slab soil gas sample. When finished sampling, replace the protective cap and flush mount cover until the next sampling event. If the sampling is complete, extract the Vapor Pin™.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the Vapor Pin™ (Figure 7). Continue turning the tool to assist in extraction, then pull the Vapor Pin™ from the hole (Figure 8).

Figure 7. Removing the Vapor Pin™.

Figure 8. Extracted Vapor Pin™.

2) Fill the void with hydraulic cement and smooth with the trowel or putty knife.

3) Prior to reuse, remove the silicone sleeve and discard. Decontaminate the Vapor Pin™ in a hot water and Alconox® wash, then heat in an oven to a temperature of 130° C.

The Vapor Pin™ to designed be used repeatedly; however, replacement parts and supplies will be required periodically. These parts are available on-line at www.CoxColvin.com.

Replacement Parts:

Vapor Pin™ Kit Case - VPC001
Vapor Pins™ - VPIN0522
Silicone Sleeves - VPTS077
Installation/Extraction Tool - VPIE023
Protective Caps - VPPC010
Flush Mount Covers - VPFM050
Water Dam - VPWD004
Brush - VPB026

ATTACHMENT H

Sub-Slab Sampling Leak Test Data Form

Sub-Slab Sampling Leak Test Data Form

Project ID: ______________________________ Date: ____________________

Sampler: ______________________________

Sample ID	Regulator Leak Tested (y or n)	% He Inside Shroud	% He From Sample Port	Check

ATTACHMENT I

Indoor Air Building Survey Form

INDOOR AIR BUILDING SURVEY FORM
Wilcox Environmental Engineering, Inc.

Preparer's Name:____________________________Date:___________________________

Site Name:_________________________________Project No.:______________________

Site Address (include city and zip):____

Part I – Occupants

List of Current Occupants/Occupation (include children, use additional pages as necessary):

Name (Age)	Address: (Lot# or Apt #)	Sex (M/F)	Occupation

Part II – Building Characteristics

Building type: residential / multi-family residential / office / strip mall / commercial / Industrial / other

Describe building:____

Year constructed:____

Sensitive population: day care / nursing home / hospital / school / other (specify):_________

Number of floors at or above grade:________________

Number of floors below grade:_____________(full basement / crawl space / slab on grade)

Part II – Building Characteristics (continued)

Depth of basement below grade surface:________ft. Basement size:_________ft^2

Basement floor construction:________concrete / dirt / slab / stone / other (specify):_______

Foundation Walls: poured concrete / cinder blocks / stone / other (specify):___________

Basement sump present? *Yes / No* Water in sump? *Yes / No*

Significant cracks present in basement floor? *Yes / No*

Significant cracks present in basement walls? *Yes / No*

Are the basement walls or floor sealed with waterproof paint or epoxy coating? *Yes / No*

Is there a whole house fan? *Yes / No* Septic system? *Yes / Yes (but not used) / No*

Irrigation/private well? *Yes / Yes (but not used) / No*

Type of ground cover outside of building: grass / concrete / asphalt / other (specify):________

Sub-slab vapor/moisture barrier in place? *Yes / No / Don't Know*
Type of barrier?_______________________

Type of heating system (circle all that apply):
hot air circulation / hot air radiation / wood / steam radiation / heat pump /
hot water radiation / kerosene heater / electric baseboard
other (specify)_________________________

Type of ventilation system (circle all that apply):
central air conditioning / mechanical fans / bathroom ventilation fans
individual air conditioning units / kitchen range hood fan / outside air intake
other (specify)_________________________

Type of fuel utilized (circle all that apply):
Natural gas / electric / fuel oil / wood / coal / solar / kerosene
Other (specify)_________________________

Part III – Outside Contaminant Sources

Contaminated site within 50-ft (BTEX) or 100-ft (Chlorinated)?______________________

If yes: Site Name:_____________________Site Number:_____________________

Other stationary sources nearby (gas stations, emission stacks, etc.):___________________

Heavy vehicular traffic nearby (or other mobile sources):____________________________

Part IV – Indoor Contaminant Sources

Identify all potential indoor sources found in the building (including attached garages), the location of the source (floor and room), and whether the item was removed from the building 48 hours prior to the indoor air sampling event. Ventilation implemented after removal of the items should be completed at least 24 hours prior to the start of the indoor air sampling event.

Potential Sources	**Location (s)**	**Removed** (Yes / No / NA)
Gasoline/ storage cans		
Gas-powered equipment (mowers, etc.)		
Kerosene storage cans		
Paints / thinners / strippers		
Cleaning solvents/Oven Cleaner		
Carpet / upholstery cleaners		
Moth balls		
Polishes / waxes		
Insecticides		
Furniture / floor removers		
Nail polish / polish remover		
Hairspray		
Cologne / perfume		
Air fresheners		
Fuel tanks (inside building)		
Wood stoves or fireplace		
New Furniture / upholstery		
New carpet / flooring		
Hobbies – glues, paint, lacquers, darkroom chemicals, etc.		
Scented trees, wreaths, potpourri, etc.		
Other (specify)		
Other house cleaning products		

Part V – Miscellaneous Items

Do any occupants of the building smoke? *Yes / No* How often?_________________

Last time someone smoked in the building?__________________hours / days ago

Does the building have an attached garage directly connected to living space? *Yes / No*

If so, is a car usually parked in the garage? *Yes / N*
Are gas powered equipment or cans of gasoline/fuels stored in the garage? *Yes / No*

Do the occupants of the building have their clothes dry cleaned? *Yes / No*

If yes, how often? Weekly / monthly / 3-4 times a year

When was the last dry cleaned garment brought home?___________________

Do any of the occupants use solvents in work? *Yes / No*

If yes, what types of solvents are used?________________________________

If yes, are their clothes washed at work? *Yes / No*

Have any pesticides/herbicides been applied around the building or in the yard? *Yes / No*

If so, when and which chemicals?_____________________________________

Has there ever been a fire in the building? *Yes / No* If yes, when?____________

Has painting or staining been done in the building in the last 6 months? *Yes / No*

If yes, when?_______________________ and where?____________________

Part VI – General Observations

Provide any information that may be pertinent to the sampling event and may assist in the data interpretations process.

____

____

____

Part VII – Sampling Information

Sampler's Name____

Sample Source: Indoor Air / Sub-Slab / Near Slab Soil Gas / Exterior Soil Gas

Sampler Type: 400 mL-1.0L Summa Canister / 6 L Summa Canister / Other (specify):______________________________

Analytical Method: TO-14A / TO-15 / TO-15 SIM / other_______________________

Laboratory:____

Sample locations (floor, room):

Field/Sample ID#____________________ Field/Sample ID#________________

Field/Sample ID#____________________ Field/Sample ID#________________

Were "Instructions for Occupants" followed? *Yes / No*

If not, described modifications:______________________________________

Drawing of Sample Location(s)

Part VI – Metrological Conditions

Was there significant precipitation within 12 hours prior to (or during) the sampling event? *Yes / No*
Describe the general weather conditions:____

____

Recommended Instructions for Residents

The following is a suggested list for residents to follow (to the extent practical) to reduce interference when sampling indoor air. IDEM suggests that these items be followed starting at least 48 hours prior to and during the sampling event.

- Do not open windows, fireplace opening or vents.
- Do not keep doors open.
- Do not operate ventilation fans.
- Do not use air fresheners or order eliminators.
- Do not smoke in the house to the extent practical.
- Do not use wood stoves, fireplace or auxiliary heating equipment (e.g., kerosene heater)
- Do not use paints or varnishes.
- Do not use cleaning products (e.g., bathroom cleaners, furniture polish, appliance cleaners, and floor cleaners).
- Do not use cosmetics, including hair spray, nail polish, nail polish remover, perfume, etc.
- Do not partake in indoor hobbies that use solvents.
- Do not apply pesticides.
- Do not store containers of gasoline, oil or petroleum-based or other solvents within the house or attached garage (except for fuel oil tanks).
- Do not operate or store automobile in an attached garage.

ATTACHMENT J

Soil/Groundwater Chain of Custody Form

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical™
www.pacelabs.com

Page: of

Section A **Required** Client Information:		Section B **Required** Project Information:	Section C Invoice Information:
Company:		Report To:	Attention:
Address:		Copy To:	Company Name:
			Address:
Email To:		Purchase Order No.:	Pace Quote Reference:
Phone:	Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:		Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER________

SITE LOCATION ☐ GA ☐ IL IN ☐ Il ☐ IC ☐ OH ☐ SC ☐ WI ☐ OTHER_____

Filtered (Y/N)

Requested Ana

Section D Client Information **Required**

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Residual Chlorine (Y/N)	Pace Project No. Lab I.D.
1																		N	
2																		N	
3																		N	
4																		N	
5																		N	
6																		N	
7																		N	
8																		N	
9																		N	
10																		N	
11																		N	
12																		N	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
							Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY):

ATTACHMENT 2

Health and Safety Plan

Indianapolis, IN
Ft. Wayne, IN
Evansville, IN
Cincinnati, OH

WILCOX
ENVIRONMENTAL ENGINEERING

CORPORATE OFFICE
1552 Main Street, Suite 100
Speedway, IN 46224
phone 317.472.0999
www.wilcoxenv.com

Site Specific Health and Safety Plan

Form Revision #3, 4/26/17

O'Neals Clothes Depot Cleaners
833 East Morgan Street, Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Approvals

Title	Signature	Date
Project Manager		
Corporate Health and Safety		11/27/18

HASP Site information last updated: 11/27/18

Site Specific Health and Safety Plan

Section 1 – Project Information

Client: O'Neals's Clothes Depot Cleaners	Site Contact (name and number): John O'Neal 765-342-9367	
Site Location- Street, City & State: 833 East Morgan Street, Martinsville, Indiana		Project Number: 341.14
Start Date: 7/30/18	Est. End Date:	
Project Type: RWP Implementation (soil chemical injection), groundwater monitoring, vapor sampling		

Project Team

Project Role	Name	Phone Number
Project Manager	Jeremy Kinman	317-649-0564
Health & Safety Director	Derek Faulk	260-402-4364

Subcontractors

Company	Contact Name	Phone Number
Regenesis	Owen Miller	949-366-8000

Underground Utility Location Required? ☒Yes ☐No

Private locate name: ______________________________ Contacted? ☒Yes ☐No

Public locate contacted? ☒Yes ☐No Ticket #: ____________________

Section 2 – Site Emergency Response Plan

Site personnel are trained to respond to incipient level fires & minor chemical spills. If the incident requires a higher level of response, the Site Supervisor shall implement the emergency response plan & act as the Incident Commander.

Emergency Contact Information

Type	Name	Phone Number
Emergency Medical Services & Fire		911
Local Hospital **IU Health Morgan**	2209 John R Wooden Dr, Martinsville, IN 46151	911 and 765-342-8441
Gas Utility	South Central Indiana REMC	765-342-3344
Water Utility	Martinsville Water & Sewage Utility	765-342-2449
Electric Utility	South Central Indiana REMC	765-342-3344
Hazardous Materials Response Team		911
Client Emergency Contact	John O'Neal	765-342-9367

Evacuation Rally Point: Parking lot just west of site	**Severe Weather Shelter:** Site building, nearby business or Wilcox truck
Certified First Responder(s): 911	**Location of Spill kit:** NA
Location of First Aid Kit(s): Wilcox truck **Location of Fire Extinguisher(s):** Wilcox truck	**Means of Communication:** Verbal or cell phone

ALL WORK-RELATED INCIDENTS MUST BE REPORTED. Contact your supervisor immediately.

Site Specific Health and Safety Plan

Section 3 – Description of Work

General Scope of Work:
Soil Chemical Injection

The remedial design is to provide a barrier using PlumeStop and enhanced anaerobic biodegradation to treat Tetrachloroethene (PCE). The use of PlumeStop barrier and bio-agents, Hydrogen Release Compound (HRC) and BDI Plus (BDI+) will be injected at MW-9 and MW-10. PlumeStop is a form of collodial activated carbon that works by first depositing a thin layer on activated carbon onto the aquifer matrix. After PlumeStop has deposited, sorption of the contaminants occurs onto the PlumeStop surface. As a result of the contaminants being present together on the PlumeStop surface, biodegradation is enhanced. HRC will provide a sustained source of electron donor (hydrogen) and BDI+ will supply a microbial culture containing known and proven microbes capable of degrading PCE to non-toxic compounds (e.g. Ethene and CO2).

Detailed Site Description:
Former active dry-cleaning facility currently utilized as a Fabric Care Center dry-cleaning pick-up/drop-off facility. The site is bordered by residential neighborhoods to the south, north and east. A commercial building and parking lot are to the west.

Specific Tasks to be performed and PPE Requirements:

Tasks	Personal Protective Equipment
Injection	Safety glasses, safety vest, steel toed boots, nitrile gloves. Possible hearing protection.

Section 4 – Site Requirements

Site Specific Hazards	Site Controls (Fill in controls where checked)
☐ Asbestos	
☐ Biological	
☒ Chemicals-Others	Chlorinated Solvents, Alconox, Plume Stop, HRC, Bio Dechlor, and CaCl2. SDS attached. Use care when handling injection chemicals. Stand upwind from CaCl2 unless using a full face respirator.
☐ Compressed Gas	
☐ Confined Space Entry	
☐ Construction Hazards	
☐ Corrosives	
☒ Drum Handling	Move waste drums into location when empty. Do not try to manually move once material has been placed in the drum. Be sure drums are properly labeled when material is first placed in the drum & lid is secured when finished.
☐ Electrical	
☐ Elevated work > 6 feet	
☐ Energized Equipment	
☒ Ergonomics (lifting, etc)	If lifting chemical containers, use proper lifting techniques.
☐ Explosives	
☐ Flammable/Combustible	
☒ Flying Debris	Injection material may spray up from the ground. Wear safety glasses during the process
☐ Forklift	
☒ Hand/Power Tools	Follow manufacturer safety requirements. Use tools only for intended purpose. Inspect tools before use.
☐ Heavy Equipment	
☐ Heavy Metals	
☐ High Risk Site	
☐ Hot Work (welding, cutting)	
☐ Ladders (portable & fixed)	
☐ Landfill-Methane	
☐ LOTO	

Site Specific Health and Safety Plan

☐Low Lighting	
☐Manlift (scissor, boom, etc)	
☐Material Handling	
☒Nature (insects, plants, animals)	Use bug spray if needed.
☒Noise	If injection equipment is loud, wear hearing protection when near
☐Other (specify)	
☒Overhead Utilities	Check area for overhead power lines when moving the injection equipment on site. Must have 10' of clearance.
☐Overhead Work	
☐Oxidizer	
☒Pedestrians	Small site and pedestrians may be on the sidewalk. Ensure room is allowed for pedestrians to walk on sidewalk but stay out of work zone.
☒Pinch Points	Make sure you have a good grip on the well cover when removing and fingers are out of the way when replacing the well cover to avoid pinched fingers
☐Poisons/Toxics	
☐Radiation	
☐Reactives	
☒Respiratory Hazards	Stand upwind of $CaCl_2$ unless using a full face respirator.
☐Rigging	
☐Scaffolding	
☒Slip, trips, falls	Keep a clear path of travel. Parking lot may be uneven or filled with holes.
☒Traffic	Cars may be in the parking lot. Barricade off sampling areas and wear a high viz vest.
☒Temperature (hot & cold)	Drink plenty of fluids. Wear layers and cover exposed skin. Take frequent breaks when needed to avoid cold or heat exhaustion.
☐Trenching/Excavation	
☒Underground Utilities	
☒Waste (Haz & Non)	Waste water to be disposed of in properly labeled drum.
☒Weather	If lightning/thunder is present, immediately STOP work and seek shelter. A minimum 30 minute stand down is required or until the weather passes.
☒Wilcox Vehicles	Always wear seatbelt. Drive with headlights on, even during the day. Avoid distractions while driving (cell phone, radio, eating, etc.)

Identify Site Controls to prevent unauthorized access:

☐Site security	☐Three zone setup (EZ, CRZ, SZ)	☒Cones	☐Fencing
☐Signage	☐Caution/Danger Tape	☐Physical Barriers	Other:

Is an Exclusion/Safety Zone necessary? If yes, describe the set-up. ☐Yes ☒No

Traffic cones/caution tape if needed to demarcate work zone.

Decontamination Procedures:

Describe the overall site decontamination procedure or decontamination procedures for each task.

Task	Decontamination Equipment	Decontamination Method	Disposal Requirements
Injection (contractor)	Pipes, buckets	Soap/water rinse	

Section 5 - Training Required to Perform Tasks

Required training/certificates

☒40 Hour HAZWOPER	☐Confined Space Entry	☐Lock Out Tag Out	☐Asbestos
☐24 Hour HAZWOPER	☐Respiratory Protection	☐Lift/Fall Protection	☐Qualified Electrician
☐DOT	☐Forklift	☐Heavy Equipment	☐
☐Excavation	☐Hot Work	☐Lead	Other

Medical Surveillance Requirements

☐ HAZWOPER Clearance	☐Respirator Clearance	☐Hearing Conservation	☐Asbestos
☐Lead	☐PCB's	☐Heavy Metals	☐Other:

Site Specific Health and Safety Plan

Section 6 – Air Monitoring & Action Levels

Is air monitoring required If yes, complete a separate monitoring plan. ☐Yes ☒No

Hazardous Substance(s) of Concern – Attach Air Monitoring Log to record results. Attach equipment calibration records.

Hazardous Substance	Exposure Limit	Monitoring Frequency	Task associated with exposure

Site Specific Health and Safety Plan

Job Hazard/Activity Analysis

ACTIVITY HAZARDS ANALYSIS

M

Overall Risk Assessment Code (RAC)
(Use highest code)

Project O'Neal's Clothes Depot Cleaners	Date Prepared 12/9/2015	Date Revised NA
Activity **Ground Water Monitoring**	Prepared by Jeremy Kinman Reviewed and approved by Scott Randall	

E=Extremely High Risk
H=High Risk
M=Moderate Risk
L=Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

ACTIVITY STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
Mobilizing / Demobilizing Equipment / Supplies at Each Location	Traffic	• Visually inspect vehicle before driving (tires, lights, etc). • Adjust mirrors (views for left, right and rear). • Fasten seatbelts before engaging vehicle. • Cell phone usage is prohibited while driving a vehicle. • Obey posted speed limits and traffic laws. • Place traffic cones behind vehicles as needed to alert vehicular traffic. • When possible, park sampling vehicle facing into	L

		traffic for protection. • Remove keys from ignition and engage parking brake when out of the vehicle	
Perform Site Safety Inspection	Unidentified Site hazards, potential near-misses	• Assess potential Hazards. Analyze how to reduce risk. Act to ensure sampling is performed safely. • Site safety officer conducts tailgate safety meeting by reviewing Health and Safety Plan [HASP], Vehicle Safety, Job Safety Analysis [JSA], Evacuation Plan. • Make site-specific changes to JSA, as necessary. • Sign compliance agreement to comply with HASP/JSA. • Identify nearest hospital, location of health and safety equipment (first aid kit/eye/fire extinguisher).	L
Personal Health & Safety	Heat stress and heat stroke	• Drink plenty of fluids and have plenty of fluids available (water and sports drinks are recommended; coffee and soda may actually cause further dehydration). • Wear loose, non-restrictive clothing and hat/cap. • Stay in shade as much as possible to keep cool (use vehicle and air-conditioning if necessary). • Use sunscreen to prevent sunburn and lip balm to prevent chapped lips. • Be aware of faintness, dizziness, unconsciousness, paleness, and profuse sweating in Site personnel (contact PM or if severe, contact emergency personnel). • Redness to the face, high body temperature, and lack of sweating may indicate heat stroke (contact emergency personnel immediately).	M
Access Monitoring Wells / Well Covers	Strain / sprains from opening well covers / heavy lifting / hand tools / puncture hazards from hidden boards with nails or hidden hails on the ground / biological	• Use proper lifting posture when opening/closing all well covers. • Wear leather gloves and safety glasses when opening and closing well covers and caps, tapping bolts. • Check for poisonous spiders, insects, etc. • Stand upwind of well when removing cover. • Ensure well is securely closed after sampling.	L

Calibrate and Check Over All Equipment	Equipment malfunction, inaccurate data recovery	• Calibrate water level/ water quality meter(s) and check over to ensure they are working properly.	
Measuring Water Levels	Dermal contact and inhalation of potential constituents	• Perform careful triple-rinse decontamination of sounder or interface meter. • Wear Nitrile gloves when handling water. Be careful not to splash or spill large amounts of water on clothing or on the Site.	L
Well Purge & Sample	Pinch points / cross-contamination of wells / spills, leaks, slips, trips / Chemical exposure	• Keep hands clear of well opening when inserting bailer or pump tubing. • Replace peristaltic pump silicon and polyethylene tubing with new at each well location. • Inspect the integrity of liquid containers prior to and during use. • Carefully pour liquids when transferring between containers. • Avoid spills when filling sample bottles, and handle with care to avoid breakage. • Ensure bottles are labeled accurately. • Maintain good housekeeping. Have trash bag at Site and clean as work is conducted. • Sample preservative may consist of injurious chemicals, such as acids. Maintain adequate rinsing/flushing capabilities and baking soda to neutralize spills.	L
Place Samples in Cooler with Ice and Padding Materials	Bottle breakage, back strain	• Wear proper PPE and pack bottles carefully (bubble wrap bags are helpful). • Ensure cooler is thoroughly iced to maintain samples at proper temperature (4 degrees Celsius).	L
Load Equipment and Supplies into Vehicle	Back injury, equipment damage	• Use proper lifting techniques when loading/lifting coolers and equipment into vehicle. • Ensure equipment and supplies are loaded correctly and do not shift during driving.	
Site Cleanup	Debris or equipment left on-Site or unsecure can cause tripping hazard	• Make careful visual sweep of Site. • Check for tools, debris or dirt left on-Site. • Remove free standing water by sweeping or with absorbent material.	

The image part with relationship ID rId1 was not found in the file.

EQUIPMENT/TOOLS	TRAINING	INSPECTIONS REQUIRED
Scissors/cutting utensils described in the site HASP.	HAZWOPER (24 HR Minimum)	General site safety inspection performed by Site Safety Officer
Sample pump, Tubing, Vice Grips		
Buckets		
12 volt battery		
Various hand tools like wrenches and screwdrivers		

WILCOX
ENVIRONMENTAL ENGINEERING

M

ACTIVITY HAZARD ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code)

Project O'Neal's Clothes Depot Cleaners	Date Prepared 12/9/2015	Date Revised NA
Activity **Oversee Well Installation/soil boring advancement**	Prepared by Jeremy Kinman Approved by Scott Randall	

E=Extremely High Risk
H=High Risk
M=Moderate Risk
L=Low Risk

Severity		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

ACTIVITY STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
Site/Drill rig Setup	Struck By/caught between	• Only qualified equipment operator to unload the drilling equipment. • Use spotter. • Unload on level ground surface. • Secure transport vehicle or trailer (emergency break for vehicle, wheel chocks if trailer is disconnected or if the transport trailer is on a sloped surface). • Ensure all tools and rig equipment is secure prior to moving. • Establish site control or hazard warning devices around the unloading area (if unloading area is near the general public or other site workers)	L

		• Do not stand directly in front of drill rig as it descends from the transport vehicle/trailer.	
	Underground equipment Utilities	• Investigate to ensure public and private underground utilities have been located by physically inspecting markings. • Ensure boring locations are at least 5-feet from marked underground utility lines.	M
	Overhead Utilities	• Inspect routes to drilling locations for overhead utility lines. • Maintain 20-foot distance for overhead utility lines or minimum clearance distances described in the Underground & Overhead Utility SOP. • Drill rig mast must be in the down position while mobilizing the drill rig to boring locations.	M
	General physical hazards	• Steel toed boots, hard hats, safety glasses, appropriate gloves (leather or mechanical), and hearing protection must be worn during drill rig operation. • No loose-fitting clothing, rings, watches, etc.; long hair to be restrained close to the head.	L
	Fire	• Smoking in designated areas only. • Fire extinguisher readily available.	L
Fueling Drill Rig	Fire	• No smoking during refueling. • Fire extinguisher readily available. • Do not lock the nozzle in the open position. • Remain with equipment at all times during refueling.	L
	Spills	• Ensure spill kit is available. • Properly clean up spills, if safe to do so. • Notify site supervisor if spill occurs. • Properly dispose of materials.	L
	Struck by vehicles and/or equipment	• Always make eye contact and get permission from vehicle or equipment operator before approaching or crossing the path of any vehicle or piece of equipment. • Follow traffic control plan. • Wear high-visibility safety vests. • Be aware of site traffic and pedestrians. • Establish a work zone large enough to protect those outside the work area from the hazards inside the work area.	L

Mobilizing drill rig and equipment to boring locations	Overturning of drill rig	• Ensure stable ground and adequate footing for machinery. Adequate ground preparation to support loads. • Establish drill pad if necessary. • Ensure drill rig is level and stabilized.	L
	Overhead Utilities	• Inspect routes to drilling locations for overhead utility lines. • Maintain 20-foot distance for overhead utility lines or minimum clearance distances described in the Underground & Overhead Utility SOP. • Drill rig mast must be in the down position while mobilizing drill rig to boring locations..	M
	Struck by objects/Overhead hazard	• Tools and equipment secured prior to rig movement	L
	Falling/Crushing injuries	• Do not ride on the drill rig. • Do not utilize the drill rig to move objects it is not designed to haul.	L
Drilling Activities	Rotating / moving parts of drill rig	• Complete daily inspection of drill rig & equipment. • Ensure appropriate guards are installed or suitable barriers to protect personnel from moving parts. • Kill switch installed, clearly identified, and operational. • Test kill switch at the beginning of each shift. • Ensure all personnel know the location of and how to engage the kill switch. • Loose clothing, long hair, and jewelry to be safely secured. • Do not approach an operating drill rig without making eye contact and getting permission from the operator.	M
	Struck by drill auger	• Wear steel toe boots, hard hat, safety glasses.	L
	Dermal or inhalation exposure to contaminants	• Conduct air monitoring for potential hazardous atmospheres as described in the project's HASP. • Don PPE as prescribed in the project's written HASP.	L
	Slips, trips, and falls	• Ensure good footing. Remove mud from work boots when possible. • Maintain good housekeeping in work area (i.e. remove excess materials, tools, and trash that	L

		create a slip or trip hazard.	
	Sprains and strains	• Use proper lifting techniques and get help with heavy or awkward loads. • Use two people to lift object > 50 pounds.	L
	Failure of drill rig components	• Defective components repaired prior to return to service. • Lockout/tag out procedures used prior to maintenance.	L
	Weather	• Drill rig not to be operated in severe inclement weather such as lightning storms, high winds, or severe rain. Mast to be lowered in these conditions.	L
	Exposure to dust	• Fugitive dust suppressed with water or by other approved means.	L
	Noise	• Wear hearing protection while the drill rig is running.	L
Handling Probes and Augers	Cuts/abrasions	• Inspect equipment for sharp protrusions or debris. • Wear cut resistant gloves.	L
	Struck by	• Make sure the path is clear before moving tools. • Maintain housekeeping. • Wear protective steel toe boots.	L
	Stains/sprains	• Use proper lifting techniques. • Utilize the drill rig move tools. • Use two people to lift objects greater than 50 pounds.	L
	Contact with contamination	• Wear PPE as described in the Site Specific HASP.	L
Hoisting operations	Overhead hazards	• Ensure all personnel stand clear during hoisting. • Ensure rigging is not damaged and is rated for what is being lifted.	L
Waste Disposal	Contact with contaminated debris and water	• Wear PPE as described in the site HASP.	L
Drum Moving	Strains and Sprains	• Fill drum a maximum of 85% full. • Use a drum dolly or similar mechanical device to move the drum.	M
Decontamination	Contact with contaminated debris and water	• Perform Decontamination according to the Site HASP. • Wear poly coated tyvek with hood and booties, face shield and nitrile gloves if pressure washing.	L

EQUIPMENT/TOOLS	TRAINING	INSPECTIONS REQUIRED
Various hand tools	Hazwoper (40 Hour)	Daily inspection of GEOPROBE
Approved cutting device – liner cutters		

Site Specific Health and Safety Plan

Site Map/Work Zones/Site Emergency Information

Site Specific Health and Safety Plan

Tailgate Meeting

TOOLBOX TALK/TAILGATE MEETING SIGN-OFF

Date: ______________________________ Presenter: ______________________________

Project: ____

Topic(s) Covered

____

Emergency Procedures:

____

Any relevant medical conditions?

____

Print Name	Signature	Company Name	Date

Use a blank sheet of paper if more space is needed for names.

Site Specific Health and Safety Plan

Safety Data Sheets

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Company: AccuStandard, Inc.
125 Market Street
New Haven, CT 06513

Date MSDS Printed: 2/13/2009
Preparation Date: 2/13/2009
Information Phone Number: 203-786-5290
Emergency Phone Number: 203-786-5290
Hours: Mon. to Fri. 8am-5pm

Catalog Number: **M-502-45**
Product Name: Tetrachloroethene
Synonyms: N/A
Formula: N/A
Molecular Weight: N/A

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Component(s) (2)	CAS #	Appr. %	ACGIH-TLV (mg/m3) TWA	STEL	skin	OSHA-PEL (mg/m3) TWA	STEL	skin
Tetrachloroethene	127-18-4	0.02	170	685				
Methanol	67-56-1	99.98	262	328	x	260		

SECTION 3 - HAZARDS IDENTIFICATION

Health and Environmental Hazards/Symptoms of Exposure:

Over exposure may cause dizziness, nausea, muscle weakness, narcosis and respiratory failure.

After ingestion or inhalation, initial symptoms may be only that of mild intoxication, but may become severe after 12 or 18 hours.

May cause eye, kidney, liver, and skin damage.

May cause central nervous system damage.

POISON: May be fatal or cause blindness if swallowed.

Fetal development abnormalities and effects on embryo or fetus have been reported from prolonged exposure to methanol in laboratory tests involving pregnant rats.

Potential Health Effects:

Irritating to eyes.

Irritating to skin.

Toxic if absorbed through skin.

Irritating to mucous membrane and upper respiratory system.

Harmful if inhaled.

Toxic if swallowed.

Routes of Entry:

Inhalation, ingestion or skin contact.

Carcinogenicity:

Contains one or more components that are classified (ACGIH, IARC, NTP, OSHA) as a suspected cancer hazard in quantities less than 0.1%.

SECTION 4 - FIRST AID MEASURES

Emergency First Aid:

Get medical assistance for all cases of overexposure.

Skin contact: Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

Eye contact: Immediately flush with plenty of water. After initial flushing, remove and contact lenses and continue flushing for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

Ingestion: Do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE FIGHTING MEASURES

Flammable Properties:

Flash Point: 52 °F (11 °C) (tcc)

Flammable Limits LEL (%): 6.7

Flammable Limits UEL (%): 36.5

Autoignition Temperature: 385 °C

Dangerous fire and explosive hazard.

HMIS® III	*	3	3	0
NFPA		1	3	0

Containers can build up pressure if exposed to heat.

Vapors can travel to a source of ignition and flash back.

During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use alcohol foam, carbon dioxide, dry chemical, or water spray when fighting fires involving this material.

Fire Fighting Procedures:

As in any fire, wear self-contained breathing apparatus pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill Response:

Wear suitable protective equipment listed under Exposure Controls / Personal Protection. Eliminate any ignition sources until the area is determined to be free from explosion or fire hazards. Contain the release and eliminate its source, if this can be done without risk. Dispose as hazardous waste. Comply with Federal, State and local regulations.

SECTION 7 - HANDLING AND STORAGE

Store in a tighly closed container.
Store in a cool area away from ignition sources and oxidizers.
Avoid breathing vapors or mists.
Use with adequate ventilation.
Do not get in eyes, on skin or clothing.
Avoid prolonged or repeated exposure.
This product should only by used by persons trained in the safe handling of hazardous chemicals.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls and Personal Protection Equipment (PPE):

Respiratory Protection: If workplace exposure limit(s) of product or any component is exceeded (see TLV/PEL), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your safety equipment supplier). Engineering and/or administrative controls should be implemented to reduce exposure.

Material should be handled or transferred in an approved fume hood or with adequate ventilation.

Protective gloves must be worn to prevent skin contact.

(Chloroprene, natural rubber, nitrile, or equivalent)

Safety glasses with side shields must be worn at all times.

General Hygiene Considerations:

Wash thoroughly after handling. Do not take internally. Eye wash and safety equipment should be readily available.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear liquid
Odor: N/A
pH: N/A
Vapor Pressure: 97 mmHg (20 °C)
Vapor Density (Air = 1): 1.1 g/L
Boiling Point: 65 °C
Melting Point: -93.9 °C
Solubility in Water: Very soluble
Specific Gravity (H_2O = 1): 0.791 g/cm3
Flash Point: 52 °F (11 °C) (tcc)
Explosion Limits (%): 6.7 to 36.5
Autoignition Temperature: 385 °C
Percent Volatile: 99.9+
Evaporation Rate (BuAc = 1): 5.9

Molecular Weight: N/A

Molecular Formula: N/A

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable

Conditions To Avoid: Heat; Contact with ignition sources

Materials To Avoid: Acids
Oxidizers

Alkali metals; Reducing agents

Hazardous Decomposition: Oxides of carbon; Formaldehyde

Hazardous Polymerization: Will not occur

SECTION 11 - TOXICOLOGICAL INFORMATION

See section 3 for specific toxicological information for the ingredients of this product.

SECTION 12 - ECOLOGICAL INFORMATION

By complying with sections 6 and 7 there will be no release to the environment.

SECTION 13 - DISPOSAL CONSIDERATIONS

Recycle or incinerate at any EPA approved facility or dispose in compliance with Federal, State and local regulations. Empty containers must be triple-rinsed prior to disposal.

SECTION 14 - TRANSPORT INFORMATION

DOT UN Number: UN1230 Shipping Class: 3 Packing Group: II FLAMMABLE

SECTION 15 - REGULATORY INFORMATION

In addition to Federal and state regulations, local regulations may apply. Check with your local regulatory authorities.

WARNING: This product contains chemical(s) known to the state of California to cause cancer.

All components are listed on the TSCA Inventory. For laboratory, reasearch and development use only. Not for manufacturing or commercial purposes.

SECTION 16 - OTHER INFORMATION

This document has been designed to meet the requirements of OSHA, ANSI and CHIPs regulations.

The statements contained herein are offered for informational purposes only and are based on technical data that we believe to be accurate. It is intended for use only by persons having the necessary technical skill and at their own discretion and risk. Since conditions and manner of use are outside our control, we make
NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE.

Legend : N/A = Not Available ND = Not Determined NR = Not Regulated

* * * End of Document * * *

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Company: AccuStandard, Inc.
125 Market Street
New Haven, CT 06513

Date MSDS Printed: 10/14/2008
Preparation Date: 10/14/2008
Information Phone Number: 203-786-5290
Emergency Phone Number: 203-786-5290
Hours: Mon. to Fri. 8am-5pm

Catalog Number: **M-502-51-10X**
Product Name: Trichloroethene
Synonyms: N/A
Formula: N/A
Molecular Weight: N/A

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Component(s) (2)	CAS #	Appr. %	ACGIH-TLV (mg/m3) TWA	ACGIH-TLV (mg/m3) STEL	ACGIH-TLV skin	OSHA-PEL (mg/m3) TWA	OSHA-PEL (mg/m3) STEL	OSHA-PEL skin
Trichloroethene	79-01-6	0.20	269	537				
Methanol	67-56-1	99.80	262	328	x	260		

SECTION 3 - HAZARDS IDENTIFICATION

Health and Environmental Hazards/Symptoms of Exposure:

Over exposure may cause dizziness, nausea, muscle weakness, narcosis and respiratory failure.

After ingestion or inhalation, initial symptoms may be only that of mild intoxication, but may become severe after 12 or 18 hours.

May cause eye, kidney, liver, and skin damage.

May cause central nervous system damage.

POISON: May be fatal or cause blindness if swallowed.

Fetal development abnormalities and effects on embryo or fetus have been reported from prolonged exposure to methanol in laboratory tests involving pregnant rats.

Potential Health Effects:

Irritating to eyes.

Irritating to skin.

Toxic if absorbed through skin.

Irritating to mucous membrane and upper respiratory system.

Harmful if inhaled.

Toxic if swallowed.

Routes of Entry:

Inhalation, ingestion or skin contact.

Carcinogenicity:

This product is or contains a component that is classified (ACGIH, IARC, NTP, OSHA) as a suspect cancer hazard.

SECTION 4 - FIRST AID MEASURES

Emergency First Aid:

Get medical assistance for all cases of overexposure.

Skin contact: Immediately wash skin with soap and plenty of water. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

Eye contact: Immediately flush with plenty of water. After initial flushing, remove and contact lenses and continue flushing for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

Ingestion: Do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE FIGHTING MEASURES

Flammable Properties:

Flash Point: 52 °F (11 °C) (tcc)

Flammable Limits LEL (%): 6.7

Flammable Limits UEL (%): 36.5

Autoignition Temperature: 385 °C

HMIS® III	*	3	3	0
NFPA		1	3	0

Dangerous fire and explosive hazard.

Containers can build up pressure if exposed to heat.

Vapors can travel to a source of ignition and flash back.

During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use alcohol foam, carbon dioxide, dry chemical, or water spray when fighting fires involving this material.

Fire Fighting Procedures:

As in any fire, wear self-contained breathing apparatus pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Spill Response:

Wear suitable protective equipment listed under Exposure Controls / Personal Protection. Eliminate any ignition sources until the area is determined to be free from explosion or fire hazards. Contain the release and eliminate its source, if this can be done without risk. Dispose as hazardous waste. Comply with Federal, State and local regulations.

SECTION 7 - HANDLING AND STORAGE

Store in a tighly closed container.
Store in a cool area away from ignition sources and oxidizers.
Avoid breathing vapors or mists.
Use with adequate ventilation.
Do not get in eyes, on skin or clothing.
Avoid prolonged or repeated exposure.
This product should only by used by persons trained in the safe handling of hazardous chemicals.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls and Personal Protection Equipment (PPE):

Respiratory Protection: If workplace exposure limit(s) of product or any component is exceeded (see TLV/PEL), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your safety equipment supplier). Engineering and/or administrative controls should be implemented to reduce exposure.

Material should be handled or transferred in an approved fume hood or with adequate ventilation.

Protective gloves must be worn to prevent skin contact.

(Chloroprene, natural rubber, nitrile, or equivalent)

Safety glasses with side shields must be worn at all times.

General Hygiene Considerations:

Wash thoroughly after handling. Do not take internally. Eye wash and safety equipment should be readily available.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear liquid
Odor: N/A
pH: N/A
Vapor Pressure: 97 mmHg (20 °C)
Vapor Density (Air = 1): 1.1 g/L
Boiling Point: 65 °C
Melting Point: -93.9 °C
Solubility in Water (%): Very soluble
Specific Gravity (H_2O = 1): 0.791 g/cm3
Flash Point: 52 °F (11 °C) (tcc)
Explosion Limits (%): 6.7 to 36.5
Autoignition Temperature: 385 °C
Percent Volatile: 99.9+
Evaporation Rate (BuAc = 1): 5.9

Molecular Weight: N/A
Molecular Formula: N/A

SECTION 10 - STABILITY AND REACTIVITY

Stability: Stable
Conditions To Avoid: Heat; Contact with ignition sources
Materials To Avoid: Acids
Oxidizers

Alkali metals; Reducing agents
Hazardous Decomposition: Oxides of carbon; Formaldehyde
Hazardous Polymerization: Will not occur

SECTION 11 - TOXICOLOGICAL INFORMATION

See section 3 for specific toxicological information for the ingredients of this product.

SECTION 12 - ECOLOGICAL INFORMATION

By complying with sections 6 and 7 there will be no release to the environment.

SECTION 13 - DISPOSAL CONSIDERATIONS

Recycle or incinerate at any EPA approved facility or dispose in compliance with Federal, State and local regulations. Empty containers must be triple-rinsed prior to disposal.

SECTION 14 - TRANSPORT INFORMATION

DOT UN Number: UN1230 Shipping Class: 3 Packing Group: II FLAMMABLE

SECTION 15 - REGULATORY INFORMATION

In addition to Federal and state regulations, local regulations may apply. Check with your local regulatory authorities.

All components are listed on the TSCA Inventory. For laboratory, reasearch and development use only. Not for manufacturing or commercial purposes.

WARNING: This product contains chemical(s) known to the state of California to cause cancer.

SECTION 16 - OTHER INFORMATION

This document has been designed to meet the requirements of OSHA, ANSI and CHIPs regulations.

The statements contained herein are offered for informational purposes only and are based on technical data that we believe to be accurate. It is intended for use only by persons having the necessary technical skill and at their own discretion and risk. Since conditions and manner of use are outside our control, we make
NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE.

Legend : N/A = Not Available ND = Not Determined NR = Not Regulated
* * * End of Document * * *

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: VINYL CHLORIDE

TRADE NAMES/SYNONYMS:
MTG MSDS 97; 1-CHLOROETHYLENE; 1-CHLOROETHENE; CHLOROETHYLENE; CHLOROETHENE; CHLORETHENE; CHLORETHYLENE; ETHYLENE MONOCHLORIDE; MONOCHLOROETHYLENE; MONOCHLORO ETHENE; MONOCHLOROETHENE; VINYL CHLORIDE MONOMER; VINYL CHLORIDE, INHIBITED; VINYL C MONOMER; RCRA U043; UN 1086; C_2H_3Cl; MAT24940; RTECS KU9625000

CHEMICAL FAMILY: halogenated, aliphatic

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: VINYL CHLORIDE
CAS NUMBER: 75-01-4
PERCENTAGE: >99.9

COMPONENT: PHENOL
CAS NUMBER: 108-95-2
PERCENTAGE: <0.1

COMPONENT: INHIBITORS
CAS NUMBER: Not assigned.
PERCENTAGE: <0.1

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=4 REACTIVITY=1

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: gas
ODOR: faint odor, sweet odor
MAJOR HEALTH HAZARDS: harmful if swallowed, skin irritation, eye irritation, central nervous system depression, cancer hazard (in humans)
PHYSICAL HAZARDS: Flammable gas. May cause flash fire. May polymerize. Containers may rupture or explode.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, nausea, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, joint pain, loss of coordination, hearing loss, lung congestion
LONG TERM EXPOSURE: impotence, bluish skin color, blood disorders, liver damage, cancer
SKIN CONTACT:
SHORT TERM EXPOSURE: irritation, blisters
LONG TERM EXPOSURE: irritation, blisters
EYE CONTACT:
SHORT TERM EXPOSURE: irritation, eye damage
LONG TERM EXPOSURE: irritation, eye damage
INGESTION:
SHORT TERM EXPOSURE: frostbite
LONG TERM EXPOSURE: cancer

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

EYE CONTACT: Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Severe explosion hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking.

FLASH POINT: -108 F (-78 C) (CC)
LOWER FLAMMABLE LIMIT: 3.6%
UPPER FLAMMABLE LIMIT: 33%
AUTOIGNITION: 882 F (472 C)

6. ACCIDENTAL RELEASE MEASURES

WATER RELEASE:
Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Inside storage: Store in a cool, dry place. Store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. See original container for storage recommendations. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
VINYL CHLORIDE:
1.0 ppm OSHA TWA
5 ppm OSHA STEL 15 minute(s)
0.5 ppm OSHA action level 8 hour(s)
1 ppm ACGIH TWA
NIOSH TWA (lowest feasible concentration)

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: For the gas: Wear appropriate chemical resistant gloves. For the liquid: Wear insulated gloves.
OSHA REGULATED SUBSTANCES: U.S. OSHA 29 CFR 1910.1017.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
OSHA Standard:
Respirator selection should comply with 29 CFR 1910.134, 29 CFR 1910.1017, and the final rule published in the Federal Register on August 24, 2006.
NIOSH Recommendations:
At any detectable concentration -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.
Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: colorless
ODOR: faint odor, sweet odor
MOLECULAR WEIGHT: 62.50
MOLECULAR FORMULA: C-H2-C-H-Cl
BOILING POINT: 9 F (-13 C)
FREEZING POINT: -245 F (-154 C)
VAPOR PRESSURE: 2515.6 mmHg @ 21.1 C
VAPOR DENSITY (air=1): 2.2
SPECIFIC GRAVITY (water=1): 0.9106
WATER SOLUBILITY: 0.25%
PH: Not applicable
VOLATILITY: Not applicable
ODOR THRESHOLD: 260 ppm
EVAPORATION RATE: Not applicable
VISCOSITY: 0.01072 cP @ 20 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: alcohol, ether, carbon tetrachloride, benzene

10. STABILITY AND REACTIVITY

REACTIVITY: May polymerize. Avoid contact with light or storage and use above room temperature.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES: metal carbide, metals, oxidizing materials, peroxides

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: halogenated compounds, oxides of carbon, phosgene

POLYMERIZATION: May polymerize. Avoid contact with heat, light, air, water or incompatible materials. Closed containers may rupture violently.

11. TOXICOLOGICAL INFORMATION

VINYL CHLORIDE:
TOXICITY DATA: 18 pph/15 minute(s) inhalation-rat LC50; 500 mg/kg oral-rat LD50
CARCINOGEN STATUS: OSHA: Carcinogen; NTP: Known Human Carcinogen; IARC: Human Sufficient Evidence, Animal Sufficient Evidence, Group 1; ACGIH: A1 -Confirmed Human Carcinogen;

EC: Category 1
LOCAL EFFECTS:
Irritant: skin, eye
ACUTE TOXICITY LEVEL:
Toxic: ingestion
Relatively Non-toxic: inhalation
TARGET ORGANS: central nervous system
TUMORIGENIC DATA: Available.
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.
ADDITIONAL DATA: Stimulants such as epinephrine may induce ventricular fibrillation. May cause birth defects.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 388000 ug/L 10 month(s) LETH (Mortality) Northern pike (Esox lucius)

INVERTEBRATE TOXICITY: 41.74 ug/L 72 day(s) (Residue) Mosquito (Culex pipiens quinquefasciata)

ALGAL TOXICITY: 41.74 ug/L 72 day(s) (Residue) Green algae (Oedogonium cardiacum)

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Hazardous Waste Number(s): D043. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.2 mg/L. U043.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Vinyl chloride, stabilized
ID NUMBER: UN1086
HAZARD CLASS OR DIVISION: 2.1
LABELING REQUIREMENTS: 2.1
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: 150 kg

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Vinyl chloride, stabilized
UN NUMBER: UN1086
CLASS: 2.1

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
Vinyl chloride: 1 LBS RQ
PHENOL: 1000 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: Yes
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
Vinyl chloride

OSHA PROCESS SAFETY (29 CFR 1910.119): Not regulated.

STATE REGULATIONS:
California Proposition 65:
Known to the state of California to cause the following:
Vinyl chloride
Cancer (Feb 27, 1987)

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: ABD2

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

MATHESON TRI-GAS, INC. MAKES NO EXPRESS OR IMPLIED WARRANTIES, GUARANTEES OR REPRESENTATIONS REGARDING THE PRODUCT OR THE INFORMATION HEREIN, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR USE. MATHESON TRI-GAS, INC. SHALL NOT BE LIABLE FOR ANY PERSONAL INJURY, PROPERTY OR OTHER DAMAGES OF ANY NATURE, WHETHER COMPENSATORY, CONSEQUENTIAL, EXEMPLARY, OR OTHERWISE, RESULTING FROM ANY PUBLICATION, USE OR RELIANCE UPON THE INFORMATION HEREIN.

Material Safety Data Sheet

Version 4.2
Revision Date 05/20/2011
Print Date 10/14/2011

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	*cis*-1,2-Dichloroethene
Product Number	:	48597
Brand	:	Supelco
Supplier	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052
Emergency Phone # (For both supplier and manufacturer)	:	(314) 776-6555
Preparation Information	:	Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid

Target Organs

Central nervous system, Liver, Kidney

GHS Classification
Flammable liquids (Category 2)
Acute toxicity, Inhalation (Category 4)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

HMIS Classification

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical hazards:	1

NFPA Rating

Health hazard:	2
Fire:	3

Reactivity Hazard: 0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : *cis*-Acetylene dichloride
cis-1,2-Dichloroethylene

Formula : $C_2H_2Cl_2$ $C_2H_2Cl_2$

Molecular Weight : 96.94 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
cis-Dichloroethylene			
156-59-2	205-859-7	602-026-00-3	-

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature: 2 - 8 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	light yellow

Safety data

pH	no data available
Melting point/freezing point	Melting point/range: -80 °C (-112 °F) - lit.
Boiling point	60 °C (140 °F) - lit.
Flash point	6.0 °C (42.8 °F) - closed cup
Ignition temperature	no data available
Autoignition temperature	no data available

Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	1.284 g/cm3 at 25 °C (77 °F)
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions

Vapours may form explosive mixture with air.

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
Inhalation LC50
LC50 Inhalation - rat - 13700 ppm
Remarks: Behavioral:Somnolence (general depressed activity). Liver:Fatty liver degeneration.

Dermal LD50
no data available

Other information on acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Teratogenicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure
narcosis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects
no data available

Additional Information
RTECS: KV9420000

12. ECOLOGICAL INFORMATION

Toxicity

no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1150 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: 1,2-DICHLOROETHYLENE
Marine pollutant: No

IATA
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Site Specific Health and Safety Plan

HASP Sign Off

Client: Site Location- Street: City & State:

I have read, understood and agree with the information set forth in this Health & Safety Plan, and will follow guidance in the plan and in the Wilcox Safety manual. As a Wilcox employee, subcontractor, visitor or others at the site, I acknowledge and will abide by the rules and provisions in this document.

Print Name	Signature	Company Name	Date

Site Specific Health and Safety Plan

Site Inspection

PROJECT NAME:	LOCATION:
PROJECT NUMBER:	DATE:
PROJECT MANAGER:	COMPLETED BY:
SITE DESCRIPTION AND NATURE OF WORK:	

HAZARD COMMUNICATION
[ ]Chemical hazards identified
[ ]All containers properly labeled
[ ]SDS on site
[ ]Site safety briefing completed and documented

ACCIDENTS/EMERGENCY INFO
[ ]First aid personnel identified
[ ]Hospital location identified
[ ]Police/Fire/Ambulance phone numbers available
[ ]Incident investigation forms available
[ ]Fire extinguisher present

SANITATION
[ ]Washing & toilet facilities available
[ ]Approved trash receptacle available
[ ]Water/refreshments available

STORAGE
[ ]Tools/Drill tooling/supplies safely stacked to prevent rolling or collapse
[ ]Work areas and passage ways kept clear

HOUSEKEEPING
[ ]Work & storage areas clean and orderly
[ ]Combustible scrap/debris removed regularly
[ ]Flammable/toxic waste containers covered

OVERHEAD HAZARDS
[ ]15^{ft} minimum clearance maintained
[ ]All sources of falling objects/swinging loads/ rotating equipment identified
[ ]Barriers or other methods in place to prevent injury due to overhead hazards

UNDERGROUND HAZARDS
[ ]Underground hazards identified and communicated to workers on site
[ ]Utility/Dig-Safe clearance confirmed

[ ]Clearance dates: ________________________
[ ]Clearance ID#: _________________________

EXCAVATIONS and TRENCHES
[ ]All personnel and storage at least 2^{ft} from top edge of excavation
[ ]Ladder in place
[ ]Guarding/barriers in place

VEHICULAR TRAFFIC
[ ]All vehicular traffic routes which could impact worker safety identified and communicated
[ ]Barriers or other methods established to prevent injury from moving vehicles

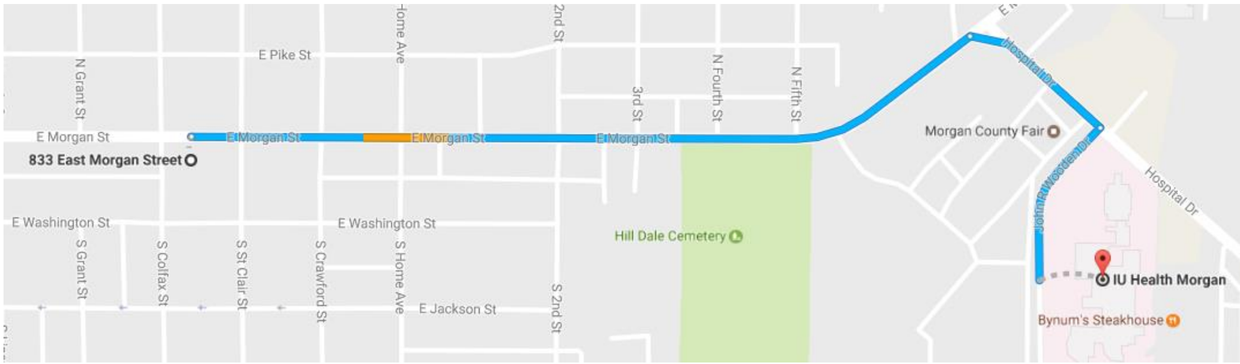
PEDESTRIAN TRAFFIC/SITE CONTROL
[ ]All walkways which could be impacted by site activities identified and communicated
[ ]Barriers or other methods established to prevent pedestrian injury from site activities

ENVIRONMENTAL HAZARDS
[ ]Poisonous plants/stinging or biting insects/vermin/sewage/etc. identified and communicated

COMMENTS/OTHER HAZARDS______________
____
____
____
____

x = OK
NA = Not Applicable

Hospital Route



2 min (0.9 mile)

via E Morgan St

Fastest route, the usual traffic

833 E Morgan St
Martinsville, IN 46151

Head east on E Morgan St toward N St Clair St

0.6 mi

Turn right onto Hospital Dr

0.1 mi

Turn right onto John R Wooden Dr
Destination will be on the left

0.1 mi

IU Health Morgan
2209 John R Wooden Dr, Martinsville, IN 46151

ATTACHMENT 3

Pace Analytical Services, Inc. Quality Assurance Manual – Indianapolis, Indiana Laboratory

QUALITY ASSURANCE MANUAL

Quality Assurance/Quality Control Policies and Procedures

Pace Analytical Services – Indianapolis

7726 Moller Road, Indianapolis, IN 46217 (317) 228-3100

CORPORATE APPROVAL

Steve A. Vanderboom
President/CEO
1800 Elm Street, Suite 200
Minneapolis, MN 55414 (612) 607-1700

11-12-2014
Date

Richard M. Henson
Corporate Director of Quality
1800 Elm Street, Suite 200
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11/12/2014
Date

LOCAL APPROVAL

Karl Anderson
Laboratory Senior General Manager
317-228-3100

November 11, 2014
Date

Laboratory Assistant General Manager
317-228-3100

November 10, 2014
Date

Beth Schrage
Laboratory Quality Manager
317-228-3100

November 6, 2014
Date

Daniel D. Mack
Laboratory Technical Director
317-228-3100

November 10, 2014
Date

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Table of Contents

1.0. INTRODUCTION AND ORGANIZATIONAL STRUCTURE

“Working together to protect our environment and improve our health”
Pace Analytical Services Inc. - Mission Statement

1.1. Introduction to PASI

1.1.1. Pace Analytical Services, Inc. (PASI) is a privately held, full-service analytical testing firm operating a nationwide system of laboratories. PASI offers extensive services beyond standard analytical testing, including: bioassay for aquatic toxicity, air toxics, dioxins and coplanar PCBs by high resolution mass spectroscopy , radiochemical analyses, product testing, pharmaceutical testing, field services and mobile laboratory capabilities. PASI has implemented a consistent Quality System in each of its laboratories and service centers. In addition, the company utilizes an advanced data management system that is highly efficient and allows for flexible data reporting. Together, these systems ensure data reliability and superior on-time performance. This document defines the Quality System and QA/QC protocols.

1.1.2. Our goal is to combine our expertise in laboratory operations with customized solutions to meet the specific needs of our customers.

1.2. Statement of Purpose

1.2.1. To meet the business needs of our customers for high quality, cost-effective analytical measurements and services.

1.3. Quality Policy Statement and Goals of the Quality System

1.3.1. PASI management is committed to maintaining the highest possible standard of service for our customers by following a documented quality system that is fully compliant with the applicable NELAC or TNI standards. The overall objective of this quality system is to provide reliable data of known quality through adherence to rigorous quality assurance policies and quality control procedures as documented in this Quality Assurance Manual.

1.3.2. All personnel within the PASI network are required to be familiar with all facets of the quality system relevant to their position and implement these policies and procedures in their daily work. This daily focus on quality is applied with initial project planning, continued through all field and laboratory activities, and is ultimately included in the final report generation.

1.3.3. PASI management demonstrates its commitment to quality by providing the resources, including facilities, equipment, and personnel to ensure the adherence to these documented policies and procedures and to promote the continuous improvement of the quality system. All PASI personnel must comply with all current applicable state, federal, and industry standards (2003 NELAC Standard, 2009 TNI Standard, etc.), and are required to perform all tests in accordance with stated methods and customer requirements.

1.4. Core Values

1.4.1. **Integrity-** Pace personnel are required to abide by the PASI Code of Ethics and all Pace employees must go through Data Integrity/Ethics training upon initial orientation and as an annual refresher.

1.4.2. **Value Employees-** Pace management views employees as our most important asset and communicates to them the relevance and importance of their activities within their job functions and how they contribute to the achievement of the objectives of the quality management system.

1.4.3. **Know Our Customers-** Pace makes every effort to know our customers and address their sampling and analytical needs. More information on this item can be found in section 2.0.

1.4.4. **Honor Commitments-** Pace labs focus on making solid commitments with regards to quality, capacity, and agreed upon turnaround time to our customers.

1.4.5. **Flexible Response To Demand-** Pace labs are equipped with both the material and personnel resources to enable them to be responsive to the demands of customers when situations or projects need change.

1.4.6. **Pursue Opportunities-** Pace is committed to pursuing opportunities for the growth of the company by constantly exploring markets and areas where we can expand.

1.4.7. **Continuously Improve-** Pace has committed much time and effort into establishing a continuous improvement program where company personnel meet on a regular basis to share ideas in cost reduction, production improvement and standardization in order to develop best practices. This information, as well as company financial and production metrics, are tracked, evaluated, and shared with each Pace facility.

1.5. Code of Ethics

1.5.1. PASI's fundamental ethical principles are as follows:

1.5.1.1. Each PASI employee is responsible for the propriety and consequences of his or her actions;

1.5.1.2. Each PASI employee must conduct all aspects of Company business in an ethical and strictly legal manner, and must obey the laws of the United States and of all localities, states and nations where PASI does business or seeks to do business;

1.5.1.3. Each PASI employee must reflect the highest standards of honesty, integrity and fairness on behalf of the Company with customers, suppliers, the public, and one another.

1.5.1.4. Each PASI employee must recognize and understand that our daily activities in environmental laboratories affect public health as well as the environment and that environmental laboratory analysts are a critical part of the system society depends upon to improve and guard our natural resources:

1.5.2. Strict adherence by each PASI employee to this Code of Ethics and to the Standards of Conduct is essential to the continued vitality of PASI and to continue the pursuit of our common mission to protect our environment and improve our health.

1.5.3. Failure to comply with the Code of Ethics and Standards of Conduct will result in disciplinary action up to and including termination and referral for civil or criminal prosecution where appropriate. An employee will be notified of an infraction and given an opportunity to explain, as prescribed under current disciplinary procedures.

1.5.4. Any Pace employee can contact corporate management to report an ethical concern by calling the anonymous hotline at 612-607-6431.

1.6. Standards of Conduct

1.6.1. Data Integrity

1.6.1.1. The accuracy and integrity of the analytical results and its supporting documentation produced at PASI are the cornerstones of the company. Lack of data integrity is an assault on our most basic values putting PASI and its employees at grave financial and legal risk and will not be tolerated. Therefore, employees are to accurately prepare and maintain all technical records, scientific notebooks, calculations, and databases. Employees are prohibited from making false entries or misrepresentations of data for any reason.

1.6.1.2. Managerial staff must make every effort to ensure that personnel are free from any undue pressures that may affect the quality or integrity of their work including commercial, financial, over-scheduling, and working condition pressures.

1.6.2. Confidentiality

1.6.2.1. PASI employees must not use or disclose confidential or proprietary information except when in connection with their duties at PASI. This is effective over the course of employment and for an additional period of two years thereafter.

1.6.2.2. Confidential or proprietary information, belonging to either PASI and/or its customers, includes but is not limited to test results, trade secrets, research and development matters, procedures, methods, processes and standards, company-specific techniques and equipment, marketing and customer information, inventions, materials composition, etc.

1.6.3. Conflict of Interest

1.6.3.1. PASI employees must avoid situations that might involve a conflict of interest or could appear questionable to others. The employee must be careful in two general areas:

1.6.3.1.1. Participation in activities that conflict or appear to conflict with the employees' PASI responsibilities.

1.6.3.1.2. Offering or accepting anything that might influence the recipient or cause another person to believe that the recipient may be influenced to behave or in a different manner than he would normally. This includes bribes, gifts, kickbacks, or illegal payments.

1.6.3.2. Employees are not to engage in outside business or economic activity relating to a sale or purchase by the Company. Other problematic activities include service on the Board of Directors of a competing or supplier company, significant ownership in a competing or supplier company, employment for a competing or supplier company, or participation in any outside business during the employee's work hours.

1.6.4. Compliance

1.6.4.1. All employees are required to read, understand, and comply with the various components of the standards listed in this document. As confirmation that they understand their responsibility, each employee is required to sign an acknowledgment form annually that then becomes part of the employee's permanent record. Employees will be held accountable for complying with the Quality Systems as summarized in the Quality Assurance Manual.

1.7. Laboratory Organization

1.7.1. The PASI Corporate Office centralizes company-wide accounting, business development, financial management, human resources development, information systems, marketing, quality, safety, and training activities. PASI's Director of Quality is responsible for assisting the development, implementation and monitoring of quality programs for the company. See Attachment IIB for the Corporate Organizational structure.

1.7.2. Each laboratory within the system operates with local management, but all labs share common systems and receive support from the Corporate Office.

1.7.3. A Senior General Manager (SGM) oversees all laboratories and service centers in their assigned region. Each laboratory or facility in the company is then directly managed by an SGM, a General Manager (GM), an Assistant General Manager (AGM), or an Operations Manager (OM). Quality Managers (QM) or Senior Quality Managers (SQM) at each laboratory report directly to the highest level of local laboratory management, however named, that routinely makes day-to-day decisions regarding that facility's operations. The QMs and SQMs will also receive guidance and direction from the corporate Director of Quality.

1.7.4. The SGM, GM, AGM or OM, or equivalent functionality in each facility, bears the responsibility for the laboratory operations and serves as the final, local authority in all matters. In the absence of these managers, the SQM/QM serves as the next in command, unless the manager in charge has assigned another designee. He or she assumes the responsibilities of the manager, however named, until the manager is available to resume the duties of their position. In the absence of both the manager and the SQM/QM, management responsibility of the laboratory is passed to the Technical Director, provided such a position is identified, and then to the most senior department manager until the return of the lab manager or SQM/QM. The most senior department manager in charge may include the Client Services Manager or the Administrative Business Manager at the discretion of the SGM/GM/AGM/OM.

1.7.5. A Technical Director who is absent for a period of time exceeding 15 consecutive calendar days shall designate another full-time staff member meeting the qualifications of the technical director to temporarily perform this function. The laboratory SGM/GM/AGM/OM or SQM/QM has the authority to make this designation in the event the existing Technical Director is unable to do so. If this absence exceeds 35 consecutive calendar days, the primary accrediting authority shall be notified in writing.

1.7.6. The SQM/QM has the responsibility and authority to ensure the Quality System is implemented and followed at all times. In circumstances where a laboratory is not meeting the established level of quality or following the policies set forth in this Quality Assurance Manual, the SQM/QM has the authority to halt laboratory operations should he or she deem such an action necessary. The SQM/QM will immediately communicate the halting of operations to the SGM/GM/AGM/OM and keep them posted on the progress of corrective actions. In the event the SGM/GM/AGM/OM and the SQM/QM are not in agreement as to the need for the suspension, the Chief Operating Officer and Director of Quality will be called in to mediate the situation.

1.7.7. The technical staff of the laboratory is generally organized into the following functional groups:

- Organic Sample Preparation
- Wet Chemistry Analysis
- Metals Analysis
- Volatiles Analysis
- Semi-volatiles Analysis
- Radiochemical Analysis
- Microbiology

1.7.8. Appropriate support groups are present in each laboratory. The actual organizational structure for PASI – Indianapolis is listed in Attachment IIA. In the event of a change in SGM/GM/AGM/OM, SQM/QM, or any Technical Director, the laboratory will notify its accrediting authorities and revise the organizational chart in the Quality Assurance Manual (QAM) within 30 days. For changes in Department Managers or Supervisors or other laboratory personnel, no notifications will be sent to the laboratory's accrediting agencies; changes to the organizational chart will be updated during or prior to the annual review process. Changes or additions in these key personnel will also be noted by additional signatures on the QAM, as applicable. In any case, the QAM will remain in effect until the next scheduled revision.

1.8. Laboratory Job Descriptions

1.8.1. Senior General Manager

- Oversees all functions of all the operations within their designated region;
- Oversees the development of local GMs/AGMs/OMs within their designated region;
- Oversees and authorizes personnel development including staffing, recruiting, training, workload scheduling, employee retention and motivation;
- Oversees the preparation of budgets and staffing plans for all operations within their designated region;
- Ensures compliance with all applicable state, federal and industry standards;
- Works closely with Regional Sales Management.

1.8.2. General Manager

- Oversees all functions of their assigned operations;
- Authorizes personnel development including staffing, recruiting, training, workload scheduling, employee retention and motivation;
- Prepares budgets and staffing plans;
- Monitors the Quality Systems of the laboratory and advises the SQM/QM accordingly;
- Ensures compliance with all applicable state, federal and industry standards.

1.8.3. Assistant General Manager / Operations Manager

- In the absence of the SGM/GM, performs all duties as listed above for the SGM or GM;
- Oversees the daily production and quality activities of all departments;
- Manages all departments and works with staff to ensure department objectives are met;

- Works with all departments to ensure capacity and customer expectations are accurately understood and met;
- Works with SGM/GM to prepare appropriate budget and staffing plans for all departments;
- Responsible for prioritizing personnel and production activities within all departments;
- Performs formal and informal performance reviews of departmental staff.

1.8.4. Quality Manager

- Responsible for implementing, maintaining and improving the quality system while functioning independently from laboratory operations. Reports directly to the highest level of local laboratory facility management, however named, that routinely makes day-to-day decisions regarding laboratory operations, but receives direction and assistance from the Corporate Director of Quality. They may also report to a Senior Quality Manager within the same facility;
- Ensures that communication takes place at all levels within the lab regarding the effectiveness of the quality system and that all personnel understand their contributions to the quality system;
- Monitors Quality Assurance/Quality Control activities to ensure that the laboratory achieves established standards of quality (as set forth by the Corporate Quality office). The Quality Manager is responsible for reporting the lab's level of compliance to these standards to the Corporate Director of Quality on a quarterly basis;
- Maintains records of quality control data and evaluates data quality;
- Conducts periodic internal audits and coordinates external audits performed by regulatory agencies or customer representatives;
- Reviews select laboratory data and final reports;
- May review tenders, contracts and QAPPs to ensure the laboratory can meet the data quality objectives for any given project;
- Reviews and maintains records of proficiency testing results;
- Maintains the document control system;
- Assists in development and implementation of appropriate training programs;
- Provides technical support to laboratory operations regarding methodology and project QA/QC requirements;
- Maintains certifications from federal and state programs;
- Ensures compliance with all applicable state, federal and industry standards;
- Maintains the laboratory training records, including those in the Learning Management System (LMS), and evaluates the effectiveness of training;
- Monitors correctives actions;
- Maintains the currency of the Quality Manual.

1.8.5. Quality Analyst

- Assists the SQM/QM in the performance of quality department responsibilities as delegated by the SQM/QM;
- Reviews select laboratory data and final reports;
- Generates and reviews QC data validation packages;
- Assists in monitoring QA/QC data;
- Assists in internal audits;
- Assists in maintaining training records;
- Assists in maintaining the document control system;

1.8.6. Technical Director

- Monitors the standards of performance in quality assurance and quality control data;
- Monitors the validity of analyses performed and data generated;
- Reviews tenders, contracts and QAPPs to ensure the laboratory can meet the data quality objectives for any given project;
- Serves as the manager of the laboratory in the absence of the SGM/GM/AGM/OM and SQM/QM;
- Provides technical guidance in the review, development, and validation of new methodologies.

1.8.7. Administrative Business Manager

- Responsible for financial and administrative management for the entire facility;
- Provides input relative to tactical and strategic planning activities;
- Organizes financial information so that the facility is run as a fiscally responsible business;
- Works with staff to confirm that appropriate processes are put in place to track revenues and expenses;
- Provide ongoing financial information to the SGM/GM/AGM/OM and the management team so they can better manage their business;
- Utilizes historical information and trends to accurately forecast future financial positions;
- Works with management to ensure that key measurements are put in place to be utilized for trend analysis—this will include personnel and supply expenses, and key revenue and expense ratios;
- Works with SGM/GM/AGM/OM to develop accurate budget and track on an ongoing basis;
- Works with entire management team to submit complete and justified capital budget requests and to balance requests across departments;
- Works with project management team and administrative support staff to ensure timely and accurate invoicing.

1.8.8. Client Services Manager

- Oversees all the day to day activities of the Client Services Department which includes Project Management and, possibly, Sample Receiving;
- Responsible for staffing and all personnel management related issues for Client Services;
- Serves as the primary senior consultant to customers on all project related issues such as set up, initiation, execution and closure;
- Performs or is capable of performing all duties listed for that of Project Manager.

1.8.9. Project Manager

- Coordinates daily activities including taking orders, reporting data and analytical results;
- Serves as the primary technical and administrative liaison between customers and PASI;
- Communicates with operations staff to update and set project priorities;
- Provides results to customers in the requested format (verbal, hardcopy, electronic, etc.);

- Works with customers, laboratory staff, and other appropriate PASI staff to develop project statements of work or resolve problems of data quality;
- Responsible for solicitation of work requests, assisting with proposal preparation and project initiation with customers and maintain customer records;
- Mediation of project schedules and scope of work through communication with internal resources and management;
- Responsible for preparing routine and non-routine quotations, reports and technical papers;
- Interfaces between customers and management personnel to achieve customer satisfaction;
- Manages large-scale complex projects;
- Supervises less experienced project managers and provide guidance on management of complex projects;
- Arranges bottle orders and shipment of sample kits to customers;
- Verifies login information relative to project requirements and field sample Chains-of-Custody;
- Enters project and sample information in the Laboratory Information Management System (LIMS) for scheduling, tracking and reporting purposes.

1.8.10. Project Coordinator

- Responsible for preparation of project specifications and provides technical/project support;
- Coordinates project needs with other department sections and assists with proposal preparation;
- Prepares routine proposals and invoicing;
- Responsible for scanning, copying, assembling and binding final reports;
- Other duties include filing, maintaining forms, process outgoing mail, maintaining training database and data entry.

1.8.11. Department Manager/Supervisor

- Oversees the day-to-day production and quality activities of their assigned department;
- Ensures that quality assurance and quality control criteria of analytical methods and projects are satisfied;
- Assesses data quality and takes corrective action when necessary;
- Approves and releases technical and data management reports;
- Trains analysts in laboratory operations and analytical procedures;
- Ensures compliance with all applicable state, federal and industry standards.

1.8.12. Group Supervisor/Leader

- Trains analysts in laboratory operations and analytical procedures;
- Organizes and schedules analyses with consideration for sample holding times;
- Implements data verification procedures by assigning data verification duties to appropriate personnel;
- Evaluates instrument performance and supervises instrument calibration and preventive maintenance programs;
- Reports non-compliance situations to laboratory management including the SQM/QM.

1.8.13. Laboratory Analyst

- Performs detailed preparation and analysis of samples according to published methods and laboratory procedures;
- Processes and evaluates raw data obtained from preparation and analysis steps;
- Generates final results from raw data, performing primary review against method criteria;
- Monitors quality control data associated with analysis and preparation. This includes examination of raw data such as chromatograms as well as an inspection of reduced data, calibration curves, and laboratory notebooks;
- Reports data in LIMS, authorizing for release pending secondary approval;
- Conducts routine and non-routine maintenance of equipment as required;
- Performs or is capable of performing all duties associated with that of Laboratory Technician.

1.8.14. Laboratory Technician

- Prepares standards and reagents according to published methods or in house procedures;
- Performs preparation and analytical steps for basic laboratory methods;
- Works under the direction of a Laboratory Analyst on complex methodologies;
- Assists Laboratory Analysts on preparation, analytical or data reduction steps for complex methodologies;
- Monitors quality control data as required or directed. This includes examination of raw data such as chromatograms as well as an inspection of reduced data, calibration curves, and laboratory notebooks.

1.8.15. Field Technician

- Prepares and samples according to published methods, PASI Quality Assurance Manual and/or customer directed sampling objectives;
- Capable of the collection of representative environmental or process samples;
- Reviews project documentation for completeness, method compliance and contract fulfillment;
- Train less experienced environmental technicians and provide guidance on sampling and analysis;
- Responsible for project initiation and contact follow-up;
- Develop sampling plans and prepare test plan documents.

1.8.16. Sample Receiving Personnel

- Signs for incoming samples and verifies the data entered on the Chain of custody forms;
- Stages samples according to EPA requirements;
- Assists Project Managers and Coordinators in filling bottle orders and sample shipments;
- Manages sample storage areas and sample disposal procedures.

1.8.17. Systems Administrator or Systems Manager

- Assists with the creation and maintenance of electronic data deliverables (EDDs);
- Coordinates the installation and use of all hardware, software and operating systems;
- Performs troubleshooting on all aforementioned systems;

- Trains new and existing users on systems and system upgrades;
- Maintains all system security passwords;
- Maintains the electronic backups of all computer systems.

1.8.18. Safety/Chemical Hygiene Officer

- Maintains the laboratory Chemical Hygiene Plan;
- Plans and implements safety policies and procedures;
- Maintains safety records;
- Organizes and/or performs safety training;
- Performs safety inspections and provides corrective/preventative actions;
- Assists personnel with safety issues.

1.8.19. Hazardous Waste Coordinator

- Evaluates waste streams and helps to select appropriate waste transportation and disposal companies;
- Maintains complete records of waste disposal including waste manifests and state reports;
- Assists in training personnel on waste-related issues such as waste handling and storage, waste container labeling, proper satellite accumulation, secondary containment, etc.;
- Conducts a weekly inspection of the waste storage areas of the laboratory.

1.9. Training and Orientation

1.9.1. Training for Pace employees is managed through a web-based Learning Management System. After a new employee has been instructed in matters of human resources, they are given instructional materials for the LMS and a password for access.

1.9.2. A new hire training checklist is provided to the new employee that lists training items for the employee to work through either independently on LMS or with their supervisor or trainer. The training items that can be completed independently include:

- Reading through applicable Standard Operating Procedures;
- Reviewing the Quality Manual and Chemical Hygiene Plan;
- Core training modules such as quality control indicators, basic laboratory skills, etc.;
- Quality Systems training including traceability of measurements, method calibration, calibration verification, accuracy, precision and uncertainty of measurements, corrective actions, documentation, and root cause analysis;
- Data Integrity/Ethics training.

1.9.3. The new employee's Department Supervisor provides the employee with a basic understanding of the role of the laboratory within the structure of PASI and the basic elements of that individual's position. Supervised training uses the following techniques:

- Hands-on training
- Training checklists/worksheets
- Lectures and training sessions
- Method-specific training
- Conferences and seminars

- Short courses
- Specialized training by instrument manufacturers
- Proficiency testing programs.
- On-line courses

1.9.4. Group Supervisors/Leaders are responsible for providing documentation of training and proficiency for each employee under their supervision. The employee's training file indicates what procedures an analyst or a technician is capable of performing, either independently or with supervision, in the form of, documentation of continuing capability, which are fully detailed in Section 3.4. Training documentation files for each person are maintained by the Quality Office either in hardcopy format or within the LMS.

1.9.5. All procedures and training records are maintained and available for review during laboratory audits. These procedures are reviewed/updated periodically by laboratory management. Additional information can be found in SOP S-IN-Q-153 *Training Procedures* or its equivalent revision or replacement.

1.10. Data Integrity System

1.10.1. The data integrity system at PASI provides assurances to management that a highly ethical approach is being applied to all planning, training and implementation of methods. Data integrity is crucial to the success of our company and Pace Analytical is committed to creating and maintaining a culture of quality throughout the organization. To accomplish this goal, PASI has implemented a data integrity system that encompasses the following four requirements:

1.10.1.1. A data integrity training program: standardized training is given to each new employee and a yearly refresher is presented to all employees. Key topics addressed by this training include:

1.10.1.1.1. Need for honesty and transparency in analytical reporting
1.10.1.1.2. Process for reporting data integrity issues
1.10.1.1.3. Specific examples of unethical behavior and improper practices
1.10.1.1.4. Documentation of non-conforming data that is still useful to the data user
1.10.1.1.5. Consequences and punishments for unethical behavior
1.10.1.1.6. Examples of monitoring devices used by management to review data and systems

1.10.1.2. Signed data integrity documentation for all employees: this includes a written quiz following the Ethics training and written agreement to abide by the Code of Ethics and Standards of Conduct explained in the employee manual.

1.10.1.3. In-depth, periodic monitoring of data integrity including peer data review and validation, internal raw data audits, proficiency testing studies, etc.

1.10.1.4. Documentation of any review or investigation into possible data integrity infractions. This documentation, including any disciplinary actions involved, corrective actions taken, and notifications to customers must be retained for a minimum of five years.

1.10.2. PASI management makes every effort to ensure that personnel are free from any undue pressures that affect the quality of their work including commercial, financial, over scheduling, and working condition pressures.

1.10.3. Corporate management also provides all PASI facilities a mechanism for confidential reporting of data integrity issues that ensures confidentiality and a receptive environment in which all employees are comfortable discussing items of ethical concern. The anonymous message line is monitored by the Corporate Director of Quality who will ensure that all concerns are evaluated and, where necessary, brought to the attention of executive management and investigated. Any Pace employee can contact corporate management to report an ethical concern by calling the anonymous hotline at **612-607-6431**.

1.11. Laboratory Safety

1.11.1. It is the policy of PASI to make safety and health an integral part of daily operations and to ensure that all employees are provided with safe working conditions, personal protective equipment, and requisite training to do their work without injury. Each employee is responsible for his/her own safety as well as those working in the immediate area by complying with established company rules and procedures. These rules and procedures as well as a more detailed description of the employees' responsibilities are contained in the corporate Safety Manual and Chemical Hygiene Plan.

1.12. Security and Confidentiality

1.12.1. Security is maintained by controlled access to laboratory buildings. Exterior doors to laboratory buildings remain either locked or continuously monitored by PASI staff. Keyless door lock combinations and computer access codes/logins are changed periodically. Posted signs direct visitors to the reception office and mark all other areas as off limits to unauthorized personnel. All visitors, including PASI staff from other facilities, must sign the Visitor's Logbook maintained by the receptionist. A staff member will accompany them during the duration of their stay on the premises unless the SGM/GM/AGM/OM, SQM/QM, or Technical Director specify otherwise. In this instance, the staff member will escort the visitor back to the reception area at the end of his/her visit where he/she signs out. The last staff member to leave their department for the day must ensure that all outside access points to that area are secure.

1.12.2. Additional security is provided where necessary, as requested by customers, or cases where national security is of concern. These areas are lockable within the facilities, or are securely offsite. Access is limited to specific individuals or their designees. Security of sample storage areas is the responsibility of the Sample Receiving personnel. Security of samples and data during analysis and data reduction is the responsibility of Department Managers or Group Supervisors. Security of customer report archives is the responsibility of the Client Services Manager. These secure areas are locked whenever these individuals or their designees are not present in the facility.

1.12.3. Access to designated laboratory sample storage locations is limited to authorized personnel only. Provisions for lock and key access are available. No samples are to be removed without proper authorization. If requested by customer or contract, samples are not to be removed from secure storage areas without filling out an associated internal chain of custody.

1.12.4. Standard business practices of confidentiality are applied to all documents and information regarding customer analyses. Specific protocols for handling confidential documents are described in PASI SOPs. Additional protocols for sample identification by internal laboratory identification numbers only are implemented as required under contract specific Quality Assurance Project Plans (QAPPs).

1.12.5. All information pertaining to a particular customer, including national security concerns will remain confidential. Data will be released to outside agencies only with written authorization from the customer or where federal or state law requires the company to do so.

1.13. Communications

1.13.1. Management within each lab bears the responsibility of ensuring that appropriate communication processes are established and that communication takes place regarding the effectiveness of the management/quality system. These communication processes may include email, regular staff meetings, senior management meetings, etc.

1.13.2. Corporate management bears the responsibility of ensuring that appropriate communication processes are established within the network of facilities and that communication takes place at a company-wide level regarding the effectiveness of the management/quality systems of all Pace facilities. These communication processes may include email, quarterly continuous improvement conference calls for all lab departments, and annual continuous improvement meetings for all department supervisors, quality managers, client services managers, and other support positions.

2.0. SAMPLE CUSTODY

2.1. Sampling Support

2.1.1. Each individual PASI laboratory provides shipping containers, properly preserved sample containers, custody documents, and field quality control samples to support field-sampling events. Guidelines for sample container types, preservatives, and holding times for a variety of methods are listed in Attachment VIII. Note that all analyses listed are not necessarily performed at all PASI laboratories and there may be additional laboratory analyses performed that are not included in these tables. Customers are encouraged to contact their local Pace Project Manager for questions or clarifications regarding sample handling. PASI - Indianapolis may provide pick-up and delivery services and basic sample collection to their customers when needed.

2.2. Field Services

2.2.1. Pace Analytical has a large Field Services Division which is based in their Minneapolis facility as well as limited field service capabilities in some of our other facilities. Field Services provides comprehensive nationwide service offerings including:

- Stack Testing
- Ambient Air
- CEM Certification Testing
- Air Quality Monitoring
- Onsite Analytical Services- FTIR and GC
- Real-time Process Diagnostic/Optimization Testing
- Wastewater, Groundwater and Drinking Water Monitoring
- Storm Water and Surface Water Monitoring
- Soil and Waste Sampling
- Mobile Laboratory Services

2.2.2. Field Services operates under the PASI Corporate Quality System, with applicable and necessary provisions to address the activities, methods, and goals specific to Field Services. All procedures and methods used by Field Services are documented in Standard Operating Procedures and Procedure Manuals.

2.3. Project Initiation

2.3.1. Prior to accepting new work, the laboratory reviews its performance capability. The laboratory confirms that sufficient personnel, equipment capacity, analytical method capability, etc., are available to complete the required work. Customer needs, certification requirements, and data quality objectives are defined and the appropriate sampling and analysis plan is developed to meet the project requirements by project managers or sales representatives. Members of the management staff review current instrument capacity, personnel availability and training, analytical procedures capability, and projected sample load. Management then informs the sales and client services personnel whether or not the laboratory can accept the new project via written correspondence, email, and/or daily operations meetings.

2.3.2. The laboratory maintains records of all such reviews, including discussions with customers. Routine analytical project documentation of quotes, notes, dates, initials, and/or recordings is maintained in a project folder by project management. Conditions for new and more complex contracts are determined by the SGM/GM/AGM/OM and sales representatives. Quality Management is consulted on technical requirements and operations staff provides input on volume capacities. Evidence of these reviews is maintained in the form of awarded Request for Proposals (RFPs), signed quotes or contracts, and a Customer Relationship Management (CRM) database. If a review identifies a potential mismatch between customer requirements and laboratory capabilities and/or capacities, Pace will specify its level of commitment by listing these exceptions to the requirements within the RFP, quote or contract.

2.3.3. Additional information regarding specific procedures for reviewing new work requests can be found in SOP S-IN-C-006 *Review of Analytical Requests* or its equivalent revision or replacement.

2.4. Chain of Custody

2.4.1. A chain of custody (COC) provides the legal documentation of samples from time of collection to completion of analysis. PASI has implemented Standard Operating Procedures to ensure that sample custody traceability and responsibility objectives are achieved for every project.

2.4.2. Field personnel or client representatives must complete a chain of custody for all samples that are received by the laboratory. The importance of completeness of COCs is stressed to the samplers and is critical to efficient sample receipt and to insure the requested methods are used to analyze the correct samples.

2.4.3. If sample shipments are not accompanied by the correct documentation, the Sample Receiving department notifies a Project Manager. The Project Manager then obtains the correct documentation/information from the customer in order for analysis of samples to proceed.

2.4.4. The sampler is responsible for providing the following information on the chain of custody form:

- Customer project name
- Project location or number
- Field sample number/identification
- Date and time sampled
- Sample matrix
- Preservative
- Requested analyses
- Sampler signature
- Relinquishing signature
- Date and time relinquished
- Sampler remarks as needed
- Custody Seal Number if present
- Regulatory Program Designation
- The state where the samples were collected to ensure all applicable state requirements are met
- Turnaround time requested
- Purchase order number

2.4.5. The COC is filled out completely and legibly with indelible ink. Errors are corrected by drawing a single line through the initial entry and initialing and dating the change. All transfers of samples are recorded on the chain of custody in the “relinquished” and “received by” sections. All information except signatures is printed.

2.4.6. Additional information can be found in SOP S-IN-C-001 *Sample Management* or its equivalent revision or replacement.

2.5. Sample Acceptance Policy

2.5.1. In accordance with regulatory guidelines, PASI complies with the following sample acceptance policy for all samples received.

2.5.2. If the samples do not meet the sample receipt acceptance criteria outlined below, the laboratory is required to document all non-compliances, contact the customer, and either reject the samples or fully document any decisions to proceed with analyses of samples which do not meet the criteria. Any results reported from samples not meeting these criteria are appropriately qualified on the final report.

2.5.3. All samples must:

- Have unique customer identification that is clearly marked with indelible ink on durable waterproof labels affixed to the sample containers that match the chain of custody.
- Have clear documentation on the chain of custody related to the location of the sampling site with the time and date of sample collection.
- Have the sampler’s name and signature.
- Have all requested analyses clearly designated on the COC.
- Have clear documentation of any special analytical or data reporting requirements.
- Be in appropriate sample containers with clear documentation of the preservatives used.
- Be correctly preserved unless the method allows for laboratory preservation.
- Be received within holding time. Any samples with hold times that are exceeded will not be processed without prior customer approval.
- Have sufficient sample volume to proceed with the analytical testing. If insufficient sample volume is received, analysis will not proceed without customer approval.
- Be received within appropriate temperature ranges - not frozen but ≤6°C (See Note 1), unless program requirements or customer contractual obligations mandate otherwise (see Note 2). The cooler temperature is recorded directly on the COC and the SCUR. Samples that are delivered to the laboratory immediately after collection are considered acceptable if there is evidence that the chilling process has been started. For example, by the arrival of the samples on ice. If samples arrive that are not compliant with these temperature requirements, the customer will be notified. The analysis will NOT proceed unless otherwise directed by the customer. If less than 72 hours remain in the hold time for the analysis, the analysis may be started while the customer is contacted to avoid missing the hold time. Data associated with any deviations from the above sample acceptance policy requirements will be appropriately qualified.

Note 1: Temperature will be read and recorded based on the precision of the measuring device. For example, temperatures obtained from a thermometer graduated to 0.1°C will be read and recorded to

±0.1°C. Measurements obtained from a thermometer graduate to 0.5°C will be read to ±0.5°C. Measurements read at the specified precision are not to be rounded down to meet the ≤6°C limit

Note 2: Some microbiology methods allow sample receipt temperatures of up to 10°C. Consult the specific method for microbiology samples received above 6°C prior to initiating corrective action for out of temperature preservation conditions.

2.5.4. Upon sample receipt, the following items are also checked and recorded:

- Presence of custody seals or tapes on the shipping containers;
- Sample condition: Intact, broken/leaking, bubbles in VOA samples;
- Sample holding time;
- Sample pH when required;
- Appropriate containers.

2.5.5. Samples for drinking water analysis that are improperly preserved, or are received past holding time, are rejected at the time of receipt, with the exception of VOA samples that are tested for pH at the time of analysis.

2.5.6. Additional information can be found in SOP S-IN-C-001 *Sample Management* or its equivalent revision or replacement.

2.6. Sample Log-in

2.6.1. After sample inspection, all sample information on the chain of custody is entered into the Laboratory Information Management System (LIMS). This permanent record documents receipt of all sample containers including:

- Customer name and contact
- Customer number
- Pace Analytical project number
- Pace Analytical Project Manager
- Sample descriptions
- Due dates
- List of analyses requested
- Date and time of laboratory receipt
- Field ID code
- Date and time of collection
- Any comments resulting from inspection for sample rejection

2.6.2. All samples received are logged into the LIMS within one working day of receipt. Sample login may be delayed due to customer clarification of analysis needed, corrective actions for sample receipt non-conformance, or other unusual circumstances. If the time collected for any sample is unspecified and Pace is unable to obtain this information from the customer, the laboratory will use 08:00 as the time sampled. All hold times will be based on this sampling time and qualified accordingly if exceeded.

2.6.3. The LIMS automatically generates a unique identification number for each sample created in the system. The LIMS sample number follows the general convention of 50XXXXXX. This unique identification number is placed on the sample container as a durable label and becomes the link between the laboratory's sample management system and the customer's field identification; it will be a permanent reference number for all future interactions.

2.6.4. Current division codes are noted below. These division codes are used primarily for accounting purposes and LIMS sample identifications. For smaller facilities, these codes may be used primarily for accounting purposes. More division codes may be added, revised or removed without updating this document.

10 = Minnesota/Montana/Virginia MN	50 = Indianapolis/Columbus
12 = Virginia/Duluth MN	60 = Kansas
20 = New Orleans/Puerto Rico	65 = New York (Schenectady)
30 = Pittsburgh	70 = Long Island
35 = Florida/South Florida	75 = Dallas
40 = Green Bay	92 = Carolinas

2.6.5. Sample labels are printed from the LIMS and affixed to each sample container.

2.6.6. Samples with hold times that are near expiration date/time may be sent directly to the laboratory for analysis at the discretion of the Project Manager and/or SGM/GM/AGM/OM.

2.6.7. Additional information can be found in SOP S-IN-C-001 *Sample Management* or its equivalent revision or replacement.

2.7. Sample Storage

2.7.1. Storage Conditions

2.7.1.1. Samples are stored away from all standards, reagents, or other potential sources of contamination. Samples are stored in a manner that prevents cross contamination. Volatile samples are stored separately from other samples. All sample fractions, extracts, leachates, and other sample preparation products are stored in the same manner as actual samples or as specified by the analytical method.

2.7.1.2. Storage blanks, consisting of two 40mL aliquots of reagent water, are stored with volatile samples and are used to measure cross-contamination acquired during storage. If applicable, laboratories must have documented procedures and criteria for evaluating storage blanks, appropriate to the types of samples being stored.

2.7.2. Temperature Monitoring

2.7.2.1. Samples are taken to the appropriate storage location immediately after sample receipt and check-in procedures are completed. All sample storage areas are located in limited access areas and are monitored to ensure sample integrity.

2.7.2.2. The temperature of each refrigerated storage area is maintained at $\leq 6^{\circ}$C (but above freezing) unless state or program requirements differ. The temperature of each freezer storage area is maintained at $<-10^{\circ}$C unless state or program requirements differ. The temperature of each storage area is monitored and documented each day of use. If the temperature falls outside the acceptable limits, the following corrective actions are taken and appropriately documented:

- The temperature is rechecked after a period of time, usually two hours, to verify temperature exceedance. Corrective action is initiated and documented if necessary.

- The SQM/QM and/or laboratory management are notified if the problem persists.
- The samples are relocated to a proper environment if the temperature cannot be maintained after corrective actions are implemented.
- The affected customers are notified, if necessary.
- Documentation is provided on analytical report.

Additional information can be found in SOP S-IN-Q-018 *Monitoring Temperature Controlled Units.*

2.7.3. **Hazardous Materials**

2.7.3.1. Pure product, known hazardous samples or potentially heavily contaminated samples must be tagged as "hazardous" or "lab pack" and stored separately from other samples.

2.7.4. **Foreign/Quarantined Soils**

2.7.4.1. Depending on the soil disposal practices of the laboratory, foreign soils and soils from USDA regulated areas are adequately segregated to enable proper sample disposal. The USDA requires these samples to be incinerated or sterilized by an approved treatment procedure. Additional information regarding USDA regulations and sample handling can be found in applicable local laboratory SOPs.

2.7.4.2. Additional information on sample storage of USDA regulated soils can be found in SOP S-IN-C-007 *USDA Regulated Soil Handling and Disposal*.

2.8. Sample Protection

2.8.1. PASI laboratory facilities are operated under controlled access protocols to ensure sample and data integrity. Visitors must register at the front desk and be properly escorted at all times.

2.8.2. Samples are removed from storage areas by designated personnel and returned to the storage areas, if necessary, after the required sample quantity has been taken.

2.8.3. Upon customer request, additional and more rigorous chain of custody protocols for samples and data can be implemented. For example, some projects may require internal chain-of-custody protocols.

2.8.4. Additional information can be found in SOP S-IN-C-001 *Sample Management* or its equivalent revision or replacement.

2.9. Subcontracting Analytical Services

2.9.1. Every effort is made to perform all analyses for PASI customers within the laboratory that receives the samples. When subcontracting to a laboratory other than the receiving laboratory, whether inside or outside the PASI network, becomes necessary, a preliminary verbal communication with that laboratory is undertaken. Customers are notified in writing of the laboratory’s intention to subcontract any portion of the testing to another laboratory. Work performed under specific protocols may involve special considerations.

2.9.2. Prior to subcontracting samples to a laboratory outside Pace Analytical, the potential sub-contract laboratory will be pre-qualified by verifying that the subcontractor meets the following criteria:

- All certifications required for the proposed subcontract are in effect,
- Sufficient professional liability and other required insurance coverage is in effect, and
- Is not involved in legal action by any federal, state, or local government agency for data integrity issues and has not been convicted in such investigation at any time during the past 5 years.

2.9.3. The contact and preliminary arrangements are made between the PASI Project Manager and the appropriate subcontract laboratory personnel. The specific terms of the subcontract laboratory agreement include:

- Method of analysis
- Number and type of samples expected
- Project specific QA/QC requirements
- Deliverables required
- Laboratory certification requirement
- Price per analysis
- Turn-around time requirements

2.9.4. Chain-of-custody forms are generated for samples requiring subcontracting to other laboratories. Sample receiving personnel re-package the samples for shipment, create a transfer chain of custody form and record the following information:

- Pace Analytical Laboratory Number
- Matrix
- Requested analysis
- Special instructions regarding turnaround, required detection or reporting limits, or any unusual information known about the samples or analytical procedure.
- Signature in "Relinquished By"

2.9.5. All subcontracted sample data reports are sent to the PASI Project Manager. Pace will provide a copy of the subcontractor's report to the client when requested.

2.9.6. Any Pace Analytical work sent to other labs within the PASI network is handled as subcontracted work and all final reports are labeled clearly with the name of the laboratory performing the work. Any non-TNI work is clearly identified. PASI will not be responsible for analytical data if the subcontract laboratory was designated by the customer.

2.9.7. Additional information can be found in SOP S-IN-C-003 *Subcontracting Samples* or its equivalent revision or replacement.

2.10. Sample Retention and Disposal

2.10.1. Samples, extracts, digestates, and leachates must be retained by the laboratory for the period of time necessary to protect the interests of the laboratory and the customer.

2.10.2. Unused portions of samples are retained by each laboratory based on program or customer requirements for sample retention and storage. The minimum sample retention time is 45 days from receipt of the samples. Samples requiring thermal preservation may be stored at ambient temperature when the hold time is expired, the report has been delivered, and/or allowed by the customer, program, or contract. Samples requiring storage beyond the minimum sample retention time due to special requests or contractual obligations may be stored at ambient temperature unless the laboratory has sufficient capacity and their presence does not compromise the integrity of other samples.

2.10.3. After this period expires, non-hazardous samples are properly disposed of as non-hazardous waste. The preferred method for disposition of hazardous samples is to return the excess sample to the customer. If it is not feasible to return samples, or the customer requires PASI to dispose of excess samples, proper arrangements will be made for disposal by an approved contractor.

2.10.4. Additional information can be found in SOP S-IN-S-002 *Waste Handling and Management* and SOP S-IN-C-001 *Sample Management* or their equivalent revisions or replacements.

3.0. ANALYTICAL CAPABILITIES

3.1. Analytical Method Sources

3.1.1. PASI laboratories are capable of analyzing a full range of environmental samples from a variety of matrices, including air, surface water, wastewater, groundwater, soil, sediment, biota, and other waste products. The latest valid editions of methodologies are applied from regulatory and professional sources including EPA, ASTM, USGS, NIOSH, Standard Methods, and State Agencies. Section 11 is a representative listing of general analytical protocol references. PASI discloses in writing to its customers and regulatory agencies any instances in which modified methods are being used in the analysis of samples.

3.1.2. In the event of a customer-specific need, instrumentation constraint or regulatory requirement, PASI laboratories reserve the right to use valid versions of methods that may not be the most recent edition available.

3.2. Analytical Method Documentation

3.2.1. The primary form of PASI laboratory documentation of analytical methods is the Standard Operating Procedure (SOP). SOPs contain pertinent information as to what steps are required by an analyst to successfully perform a procedure. The required contents for the SOPs are specified in the SOP S-IN-Q-001 *Preparation of SOPs*

3.2.2. The SOPs may be supplemented by other training materials that further detail how methods are specifically performed. This training material will undergo periodic, documented review along with the other Quality System documentation.

3.3. Analytical Method Validation and Instrument Validation

3.3.1. In some situations, PASI develops and validates methodologies or instruments that may be more applicable to a specific problem or objective. When non-standard methods are required for specific projects or analytes of interest, or when the laboratory develops or modifies a method, or when the laboratory installs a new instrument, the laboratory validates the method and/or instrument prior to utilizing it for customer samples. Method validity is established by meeting criteria for precision and accuracy as established by the data quality objectives specified by the end user of the data. The laboratory records the validation procedure, the results obtained and a statement as to the usability of the method or instrument. The minimum requirements for method or instrument validation include evaluation of sensitivity, quantitation, precision, bias, and selectivity of each analyte of interest.

3.4. Demonstration of Capability (DOC)

3.4.1. Analysts complete an initial demonstration of capability (IDOC) study prior to independently performing a method or when there is a change in instrument type, personnel, or test method, or at any time that a method has not been performed by the laboratory or analyst in a 12-month period. The mean recovery and standard deviation of each analyte, taken from 4 replicates of a quality control standard is calculated and compared to method criteria (if available) or established laboratory criteria for evaluation of acceptance. Each laboratory maintains copies of all demonstrations of capability, including those that fail acceptance criteria, and corresponding raw data for future reference and must use documented acceptance criteria to evaluate the DOC. Demonstrations of capability are verified on an annual basis.

3.4.2. For Continuing Demonstrations of Capability, the laboratories may use Performance Testing (PT) samples in lieu of the 4-replicate approach listed above. For methods or procedures that do not lend themselves to the "4-replicate" approach, the demonstration of capability requirements will be specified in the applicable SOP. Drinking Water DOCs must be done at or below the MCL.

3.4.3. Additional information can be found in SOP S-IN-Q-153 *Training Procedures* or its equivalent revision or replacement.

3.5. Regulatory and Method Compliance

3.5.1. PASI understands that expectations of our customers commonly include the assumption that laboratory data will satisfy specific regulatory requirements. Therefore PASI attempts to ascertain, prior to beginning a project, what applicable regulatory jurisdiction, agency, or protocols apply to that project. This information is also required on the chain of custody submitted with samples.

3.5.2. PASI makes every effort to detect regulatory or project plan inconsistencies, based upon information from the customer, and communicate them immediately to the customer in order to aid in the decision making process. PASI will not be liable if the customer chooses not to follow PASI recommendations.

3.5.3. It is PASI policy to disclose in a forthright manner any detected noncompliance affecting the usability of data produced by our laboratories. The laboratory will notify customers within 30 days of fully characterizing the nature of the nonconformance, the scope of the nonconformance and the impact it may have on data usability.

4.0. QUALITY CONTROL PROCEDURES

Quality control data is analyzed and where they are found to be outside pre-defined criteria, planned action is taken to correct the problem in order to prevent erroneous results from being reported. Quality control samples are to be processed in the same manner as client samples.

4.1. Method Blank

4.1.1. A method blank is used to evaluate contamination in the preparation/analysis system and is processed through all preparation and analytical steps with its associated samples.

4.1.2. A method blank is processed at a minimum frequency of one per preparation batch. In the case of a method that has no separate preparation step, a method blank is processed with no more than 20 samples of a specific matrix performed by the same analyst, using the same method, standards, and reagents.

4.1.3. The method blank consists of a matrix similar to the associated samples that is known to be free of analytes of interest. Method blanks are not applicable for certain analyses, such as pH, conductivity, flash point and temperature.

4.1.4. Each method blank is evaluated for contamination. The source of any contamination is investigated and documented corrective action is taken when the concentration of any target analyte is detected above the reporting limit and is associated with samples that also contain the target analyte above the reporting limit. Corrective actions for blank contamination may include the re-preparation and re-analysis of all samples (where possible) and quality control samples. Data qualifiers must be applied to results that are considered affected by contamination in a method blank.

4.1.5. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.2. Laboratory Control Sample

4.2.1. The Laboratory Control Sample (LCS) is used to evaluate the performance of the entire analytical system including preparation and analysis.

4.2.2. An LCS is processed at a minimum frequency of one per preparation batch. In the case of a method that has no separate preparation step, an LCS will be processed with no more than 20 samples of a specific matrix performed by the same analyst, using the same method, standards, and reagents.

4.2.3. The LCS consists of a matrix similar to the associated samples that is known to be free of the analytes of interest that is then spiked with known concentrations of target analytes.

4.2.4. The LCS contains all analytes specified by a specific method or by the customer or regulatory agency, which may or may not include the full list of target compounds. In the absence of specified components, the laboratory will spike the LCS with the following compounds:

- For multi-peak analytes (e.g. PCBs, technical chlordane, toxaphene), a representative standard will be processed.
- For methods with long lists of analytes, a representative number of target analytes may be chosen. The following criteria is used to determine the number of LCS compounds used:

- For methods with 1-10 target compounds, the laboratory will spike with all compounds;
- For methods with 11-20 target compounds, the laboratory will spike with at least 10 compounds or 80%, whichever is greater;
- For methods with greater than 20 compounds, the laboratory will spike with at least 16 compounds.

4.2.5. The LCS is evaluated against the method default or laboratory-derived acceptance criteria. For those methods that require laboratory-derived limits, method default control limits may be used until the laboratory has a minimum of 20, but preferably greater than 30, data points from which to derive internal acceptance criteria. Any compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Any sample containing a compound that was 'out-of-control' in the associated LCS must either be re-analyzed with a successful LCS or reported with the appropriate data qualifier. When the result of the LCS exceeds the upper control limit, indicating high bias, associated samples determined to be non-detect may be reported without qualification. When the result of the LCS exceeds the lower control limit, indicating low bias, associated samples and QC must be re-extracted and re-analyzed or qualified as potentially biased low.

4.2.6. For LCSs containing a large number of analytes, it is statistically likely that a few recoveries will be outside of control limits. This does not necessarily mean that the system is out of control, and therefore no corrective action would be necessary other than proper documentation. TNI has allowed for a minimum number of marginal exceedances, defined as recoveries that are beyond the LCS control limits of 3X the standard deviation, but less than the marginal exceedance limits of 4X the standard deviation. The number of allowable exceedances depends on the number of compounds in the LCS. If more analyte recoveries exceed the LCS control limits than is allowed or if any one analyte exceeds the marginal exceedance limits, then the LCS is considered non-compliant and corrective actions are necessary. The number of allowable exceedances is as follows:

- >90 analytes in the LCS- 5 analytes
- 71-90 analytes in the LCS- 4 analytes
- 51-70 analytes in the LCS- 3 analytes
- 31-50 analytes in the LCS- 2 analytes
- 11-30 analytes in the LCS- 1 analyte
- <11 analytes in the LCS- no analytes allowed out)

4.2.7. A matrix spike (MS) can be used in place of a non-compliant LCS in a batch as long as the MS passes the LCS acceptance criteria. When this happens, full documentation must be made available to the data user. If this is not allowed by a customer or regulatory body, the associated samples must be rerun with a compliant LCS or reported with appropriate data qualifiers.

4.2.8. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

4.3.1. A matrix spike (MS) is used to determine the effect of the sample matrix on compound recovery for a particular method. The information from these spikes is sample or matrix specific and is not used to determine the acceptance of an entire batch unless the MS is actually used as the LCS.

4.3.2. A **Matrix Spike/Matrix Spike Duplicate** (MS/MSD) set is processed at a frequency specified in a particular method or as determined by a specific customer request. This frequency will be specified in the applicable method SOP or customer QAPP. In the absence of such requirements, an MS/MSD set is routinely analyzed once per every 20 samples per matrix per method when adequate sample volume or weight is available.

4.3.3. The MS and MSD consist of the sample matrix that is then spiked with known concentrations of target analytes. Laboratory personnel spike customer samples that are specifically designated as MS/MSD samples or, when no designated samples are present in a batch, randomly select samples to spike that have adequate sample volume or weight. Spiked samples are prepared and analyzed in the same manner as the original samples and are selected from different customers if possible.

4.3.4. The MS and MSD contain all analytes specified by a specific method or by the customer or regulatory agency. In the absence of specified components, the laboratory will spike the MS/MSD with the same number of compounds as previously discussed in the LCS section.

4.3.5. The MS and MSD are evaluated against the method or laboratory derived criteria. Any compound that is outside of these limits is considered to be ‘out of control’ and must be qualified appropriately. Batch acceptance, however, is based on method blank and LCS performance, not on MS/MSD recoveries. The spike recoveries give the data user a better understanding of the final results based on their site specific information.

4.3.6. A matrix spike and sample duplicate will be performed instead of a matrix spike and matrix spike duplicate when specified by the customer or method.

4.3.7. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.4. Sample Duplicate

4.4.1. A sample duplicate is a second portion of sample that is prepared and analyzed in the laboratory along with the first portion. It is used to measure the precision associated with preparation and analysis. A sample duplicate is processed at a frequency specified by the particular method or as determined by a specific customer.

4.4.2. The sample and duplicate are evaluated against the method or laboratory derived criteria for relative percent difference (RPD). Any duplicate that is outside of these limits is considered to be ‘out of control’ and must be qualified appropriately.

4.4.3. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.5. Surrogates

4.5.1. Surrogates are compounds that reflect the chemistry of target analytes and are typically added to samples for organic analyses to monitor the effect of the sample matrix on compound recovery.

4.5.2. For most organic analyses, one or more surrogate compounds are added to each customer sample, method blank, LCS, MS, and calibration standard prior to extraction or analysis. The surrogates are evaluated against the method or laboratory derived acceptance criteria or against project-specific acceptance criteria specified by the client, if applicable. Any surrogate compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Samples with surrogate failures are typically re-extracted and/or re-analyzed to confirm that the out-of-control value was caused by the matrix of the sample and not by some other systematic error. An exception to this would be samples that have surrogate recoveries that exceed the upper control limit but have no reportable hits for target compounds. These samples would be reported and qualified to indicate the implied high bias would not affect the final results. For methods with multiple surrogates, documentation regarding acceptance and associated compounds will be found in the individual method SOPs.

4.5.3. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.6. Internal Standards

4.6.1. Internal Standards are method-specific analytes added to every standard, method blank, laboratory control sample, matrix spike, matrix spike duplicate, sample, and calibration standard at a known concentration, prior to analysis by certain methods for the purpose of adjusting the response factor used in quantifying target analytes. At a minimum, the laboratory will follow method specific requirements for the treatment of internal standard recoveries as they are related to the reporting of data.

4.6.2. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.7. Field Blanks

4.7.1. Field blanks are blanks prepared at the sampling site in order to monitor for contamination that may be present in the environment where samples are collected. These field quality control samples are often referenced as field blanks, rinsate blanks, or equipment blanks. The laboratory processes field blanks as routine samples.

4.8. Trip Blanks

4.8.1. Trip blanks are blanks that originate from the laboratory as part of the sampling event and are used to monitor for contamination of samples during transport. These blanks accompany the empty sample containers to the field and then accompany the collected samples back to the laboratory. These blanks are routinely analyzed for volatile methods where ambient background contamination is likely to occur. The laboratory processes trip blanks as routine samples.

4.9. Limit of Detection (LOD)

4.9.1. PASI laboratories are required to use a documented procedure to determine a limit of detection for each analyte of concern in each matrix reported. All sample processing steps of the preparation and analytical methods are included in this determination including any clean ups. For any test that does not have a valid LOD, sample results below the limit of quantitation (LOQ) cannot be reported.

4.9.2. The LOD is initially established for the compounds of interest for each method in a clean matrix with no target analytes present and no interferences at a concentration that would impact the results. The LOD is then determined every time there is a change in the test method that affects how the test is performed or when there has been a change in the instrument that affects the sensitivity. If required by customer, method or accreditation body, the LOD will be re-established annually for all applicable methods.

4.9.3. Unless otherwise noted, the method used by PASI laboratories to determine LODs is based on the Method Detection Limit (MDL) procedure outlined in 40 CFR Part 136, Appendix B. Where required by regulatory program or customer, the above referenced procedure will be followed.

4.9.4. Where specifically stated in the published method, LODs or MDLs will be performed at the listed frequency.

4.9.5. The validity of the LOD must be shown by detection (a value above zero) of the analytes in a QC sample in each quality system matrix. The QC sample must contain the analyte at no more than 3X the LOD for a single analyte test and 4X the LOD for multiple analyte tests. This verification must be performed on each instrument used for sample analysis and reporting of data. The validity of the LOD must be verified as part of the LOD determination process. This verification must be done prior to the use of the LOD for sample analysis.

4.9.6. An LOD study is not required for any analyte for which spiking solutions or quality control samples are not available such as temperature.

4.9.7. The LOD, if required, shall be verified annually for each quality system matrix, technology and analyte. In lieu of performing full LOD (MDL) studies annually, the laboratory can verify the LOD (MDL) on an annual basis, providing this verification is fully documented and does not contradict other customer or program requirements. The requirements of this verification are:

- The spike concentration of the verification must be no more than 3X times the LOD for single analyte tests or 4X the LOD for multiple analyte tests.
- The laboratory must verify the LOD on each instrument used for the reporting of sample data.
- The laboratory must be able to identify all target analytes in the verification standard (distinguishable from noise).

4.9.8. Additional information can be found in SOP S-IN-Q-004 *Determination of LOD and LOQ* or its equivalent revision or replacement.

4.10. Limit of Quantitation (LOQ)

4.10.1. A limit of quantitation (LOQ) for every analyte of concern must be determined. For PASI laboratories, this LOQ is referred to as the RL, or Reporting Limit. This RL is based on a calibration standard concentration that is used in each initial calibration. Results below the lowest calibration level may not be reported without qualification since the results would not be substantiated by a calibration standard. For methods with a determined LOD (MDL), results can be reported below the LOQ but above the LOD if they are properly qualified as estimated values (e.g., J flag). The LOQ shall be verified annually for each quality system, matrix, technology and analyte.

4.10.2. The LOQ must be higher than the LOD.

4.10.3. To verify the LOQ, the laboratory will prepare a sample in the same matrix used for the LCS. The sample will be spiked with each target analyte at a concentration equivalent to 1x-2x the RL. This sample must undergo the routine sample preparation procedure including any routine sample cleanup steps. The sample is then analyzed and the recovery of each target analyte determined. The recovery for each target analyte must meet the laboratories current control limits for an LCS. However, the annual LOQ verification is not required if the LOD was determined or verified annually on that instrument.

4.10.4. Additional information can be found in SOP S-IN-Q-004 *Determination of LOD and LOQ* or its equivalent revision or replacement.

4.11. Estimate of Analytical Uncertainty

4.11.1. PASI laboratories can provide an estimation of uncertainty for results generated by the laboratory. The estimate quantifies the error associated with any given result at a 95% confidence interval. This estimate does not include bias that may be associated with sampling. The laboratory has a procedure in place for making this estimation. In the absence of a regulatory or customer-specific procedure, PASI laboratories base this estimation on the recovery data obtained from the Laboratory Control Spikes. The uncertainty is a function of the standard deviation of the recoveries multiplied by the appropriate Student's t Factor at 95% confidence. Additional information pertaining to the estimation of uncertainty and the exact manner in which it is derived are contained in the SOP S-IN-Q-031 *Estimation of Measurement Uncertainty* or its equivalent revision or replacement.

4.11.2. The measurement of uncertainty is provided only on request by the customer, as required by specification or regulation and when the result is used to determine conformance within a specification limit.

4.12. Proficiency Testing (PT) Studies

4.12.1. PASI laboratories participate in the TNI defined proficiency testing program. PT samples are obtained from NIST approved providers and analyzed and reported at a minimum of two times per year for the relevant fields of testing per matrix, or at the frequency required by the applicable regulatory program if other than TNI.

4.12.2. The laboratory initiates an investigation whenever PT results are deemed "Not Acceptable" by the PT provider. All findings and corrective actions taken are reported to the SQM/QM or their designee. A corrective action plan is initiated and this report is sent to the appropriate state accreditation agencies for their review. Additional PTs will be analyzed and reported as needed for certification purposes.

4.12.3. PT samples are treated as typical customer samples, utilizing the same staff, methods, equipment, facilities, and frequency of analysis. PT samples are included in the laboratory's normal analytical processes and do not receive extraordinary attention due to their nature.

4.12.4. Comparison of analytical results with anyone participating in the same PT study is prohibited prior to the close of the study.

4.12.5. Additional information can be found in SOP S-IN-Q-010 *Proficiency Testing Program* its equivalent revision or replacement.

4.13. Rounding and Significant Figures

4.13.1. In general, the PASI laboratories report data to no more than three significant digits. Therefore, all measurements made in the analytical process must reflect this level of precision. In the event that a parameter that contributes to the final result has less than three significant figures of precision, the final result must be reported with no more significant figures than that of the parameter in question. The rounding rules listed below are descriptive of the LIMS and not necessarily of any supporting program such as Excel.

4.13.2. Data is compared to the reporting limits and MDLs to determine if qualifiers are needed before the rounding step occurs.

4.13.3. **Rounding:** PASI-Indianapolis follows the odd / even guidelines for rounding numbers:

- If the figure following the one to be retained is less than five, that figure is dropped and the retained ones are not changed (with three significant figures, 2.544 is rounded to 2.54).
- If the figure following the ones to be retained is greater than five, that figure is dropped and the last retained one is rounded up (with three significant figures, 2.546 is rounded to 2.55).
- If the figure following the ones to be retained is five and if there are no figures other than zeros beyond that five, then the five is dropped and the last figure retained is unchanged if it is even and rounded up if it is odd (with three significant figures, 2.525 is rounded to 2.52 and 2.535 is rounded to 2.54).

4.13.4. **Significant Digits**

4.13.4.1. PASI-Indianapolis follows the following convention for reporting to a specified number of significant figures. Unless specified by federal, state, or local requirements or on specific request by a customer, the laboratory reports:

Values > 10 – Reported to 3 significant digits
Values ≤ 10 – Reported to 2 significant digits

4.14. Retention Time Windows

4.14.1. Retention time windows are crucial to the identification of target compounds. Absolute retention times are used for compound identification in all GC methods that do not employ internal standard calibration. Retention time windows for each analyte and surrogate must be established for each chromatographic column and instrument. New retention time windows must be established when GC column geometry is affected due to maintenance.

4.14.2. One approach to establish retention time windows: Make 3 injections of all single component or multi-component analytes over a 72-hour period. Record the retention time in minutes for each analyte and surrogate to 3 decimal places. Calculate the mean and standard deviation of the three absolute retention times for each target analyte and surrogate. For multi-component analytes, choose 3-5 major peaks and calculate the mean and standard deviation for each of the peaks. If the standard deviation of the retention times of a target analyte is 0.000, the lab may use a default standard deviation of 0.01. The width of the retention time window for each analyte and surrogate and major peak in a multi-component analyte is defined as +/- 3 times the standard deviation of the mean absolute retention time established during that 72-hour period or 0.03 minutes, whichever is greater.

4.14.3. The center of the retention time window is established daily for each analyte and surrogate by using the absolute retention times from the CCV at the beginning of the analytical shift. For samples run with an initial calibration, use the retention time of the mid-point standard of the initial calibration curve.

4.14.4. For more information, please reference the local facility's analytical SOPs.

5.0. DOCUMENT MANAGEMENT AND CHANGE CONTROL

5.1. Document Management

5.1.1. Additional information can be found in SOP S-IN-Q-002 *Document Control and Management* or its equivalent revision or replacement. Information on Pace's policy for electronic signatures can also be found in this SOP.

5.1.2. Pace Analytical Services, Inc. has an established procedure for managing documents that are part of the quality system. The list of managed documents includes, but is not limited to, Standard Operating Procedures, Quality Assurance Manuals, quality policy statements, training documents, work-processing documents, charts, posters, memoranda, notices, forms, software, and any other procedures, tables, plans, etc. that have a direct bearing on the quality system.

5.1.3. A master list of all managed documents is maintained at each facility identifying the current revision status and distribution of the controlled documents. This establishes that there are no invalid or obsolete documents in use in the facility. All documents are reviewed periodically and revised if necessary. Obsolete documents are systematically discarded or archived for audit or knowledge preservation purposes.

5.1.4. Each managed document is uniquely identified to include the date of issue, the revision identification, page numbers, the total number of pages and the issuing authorities. For complete information on document numbering, refer to SOP S-ALL-Q-003 *Document Numbering.*

5.1.5. SOPs, specifically, are available to all laboratory staff via a shared network drive and/or the Learning Management System (LMS) which is a secure repository that is accessed through an internet portal. As a local alternative to the hard copy system of document control, secured electronic copies of documents may be maintained on the laboratory's local server. These document files must be a PDF version for all personnel except the Quality Department and system administrator. Other requirements for this system are as follows:

- Electronic documents must be readily accessible to all facility employees.
- All hardcopy SOPs must be distributed from the Quality Department.

5.1.6. **Quality Assurance Manual (QAM):** The Quality Assurance Manual is the company-wide document that describes all aspects of the quality system for PASI. The base QAM template is distributed by the Corporate Quality Department to each of the SQMs/QMs. The local management personnel modify the sections of the base template as necessary and as permissible and submit those modifications to the Corporate Director of Quality for review. Once approved and signed by both the CEO and the Director of Quality; the SGM/GM/AGM/OM, the SQM/QM, and any Technical Directors sign the Quality Assurance Manual. Each SQM/QM is then in charge of distribution to employees, external customers or regulatory agencies and maintaining a distribution list of controlled document copies, if applicable. The Quality Assurance Manual template is reviewed on an annual basis by all of the PASI SQMs/QMs and revised accordingly by the Director of Quality.

5.1.7. **Standard Operating Procedures (SOPs)**

5.1.7.1. SOPs fall into two categories: company-wide documents and facility specific documents. Company-wide SOPs start with the prefix S-ALL- and local SOPs start with the individual facility prefix.

5.1.7.2. The purpose of the company-wide SOPs is to establish policies and procedure that are common and applicable to all PASI facilities. Company-wide SOPs are document-controlled by the corporate quality office and signed copies are distributed to all of the SQMs/QMs. The local management personnel sign the company-wide SOPs. The SQM/QM is then in charge of distribution to employees, external customers, or regulatory agencies and maintaining a distribution list of controlled document copies.

5.1.7.3. Local PASI facilities are responsible for developing facility-specific SOPs applicable to their respective facility. The local facility develops these facility-specific SOPs based on the corporate-wide SOP template. This template is written to incorporate a set of minimum method requirements and PASI best practice requirements. The local facilities may add to or modify the corporate-wide SOP template provided there are no contradictions to the minimum method or best practice requirements. Facility-specific SOPs are controlled by the applicable SQM/QM according to the corporate document management policies.

5.1.7.4. SOPs should be reviewed every two years at a minimum although a more frequent review may be required by some state or federal agencies or customers. If no revisions are made based on this review, documentation of the review itself is made by the addition of new signatures on the cover page. If revisions are made, documentation of the revisions is made in the revisions section of each SOP and a new revision number is applied to the SOP. This provides a historical record of all revisions.

5.1.7.5. All copies of superseded SOPs are removed from general use and the original copy of each SOP is archived for audit or knowledge preservation purposes. This ensures that all PASI employees use the most current version of each SOP and provides the SQM/QM with a historical record of each SOP.

5.1.7.6. Additional information can be found in SOP S-IN-Q-001 *Preparation of SOPs* or its equivalent revision or replacement.

5.2. Document Change Control

5.2.1. Changes to managed documents are reviewed and approved in the same manner as the original review. Any revision to a document requires the approval of the applicable signatories. After revisions are approved, a revision number is assigned and the previous version of the document is officially retired. Copies may be kept for audit or knowledge preservation purposes.

5.2.2. All controlled copies of the previous document are replaced with controlled copies of the revised document and the superseded copies are destroyed or archived. All affected personnel are advised that there has been a revision and any necessary training is scheduled.

5.3. Management of Change

5.3.1. The process for documenting necessary changes within the laboratory network are not typically handled using the corrective or preventive action system as outlined in section 9.0. Management of Change is a proactive approach to dealing with change to minimize the potential negative impact of systematic change in the laboratory and to ensure that each change has a positive desired outcome. This process will primarily be used for the implementation of large scale projects and information system changes as a means to apply consistent systems or procedures within the laboratory network. The request for change is submitted by the initiator and subsequently assigned to an individual or team for development and planning. The final completion of the process culminates in final approval and verification that the procedure was effectively implemented. Additional information can be found in SOP S-IN-Q-036 *Management of Change* or its equivalent revision or replacement.

6.0. EQUIPMENT AND MEASUREMENT TRACEABILITY

Each PASI facility is equipped with sufficient instrumentation and support equipment to perform the relevant analytical testing or field procedures performed by each facility. Support equipment includes chemical standards, thermometers, balances, disposable and mechanical pipettes, etc. This section details some of the procedures necessary to maintain traceability and to perform proper calibration of instrumentation and support equipment. See Attachment III for a list of major equipment currently used at the Indianapolis PASI facility.

6.1. Standards and Traceability

6.1.1. Each PASI facility retains all pertinent information for standards, reagents, and chemicals to assure traceability to a national standard. This includes documentation of purchase, receipt, preparation, and use.

6.1.2. Upon receipt, all purchased standard reference materials are recorded into a standard logbook or database and assigned a unique identification number. The entries include the facility's unique identification number, the chemical name, manufacturer name, manufacturer's identification numbers, receipt date, and expiration date. Vendor's certificates of analysis for all standards, reagents, or chemicals are retained for future reference.

6.1.3. Subsequent preparations of intermediate or working solutions are also documented in a standard logbook or database. These entries include the stock standard name and lot number, the manufacturer name, the solvents used for preparation, the solvent lot number and manufacturer, the preparation steps, preparation date, expiration dates, preparer's initials, and a unique PASI identification number. This number is used in any applicable sample preparation or analysis logbook so the standard can be traced back to the standard preparation record. This process ensures traceability back to the national standard.

6.1.4. All prepared standard or reagent containers include the PASI identification number, the standard or chemical name, and expiration date. The date of preparation, concentration with units, and the preparer's initials can be determined by tracing the standard or reagent ID through the standard log database.

6.1.5. For containers that are too small to accommodate labels that list all of the above information associated with a standard, the minimum required information will be PASI standard ID number, standard or chemical name, and expiration date. This assures that no standard will be used past its assigned expiration date.

6.1.6. If a second source standard is required to verify an existing calibration or spiking standard, this standard must be obtained from a different manufacturer or from a different lot unless client specific QAPP requirements state otherwise.

6.1.7. Additional information concerning standards and reagent traceability can be found in the SOP S-IN-Q-025 *Standard and Reagent Management and Traceability* or its equivalent revision or replacement.

6.2. General Analytical Instrument Calibration Procedures, Organic and Inorganic

6.2.1. All support equipment and instrumentation are calibrated or checked before use to ensure proper functioning and verify that the laboratory's requirements are met. All calibrations are performed by, or under the supervision of, an experienced analyst at scheduled intervals against either certified standards traceable to recognized national standards or reference standards whose values have been statistically validated.

6.2.2. Calibration standards for each parameter are chosen to establish the linear range of the instrument and must bracket the concentrations of those parameters measured in the samples. The lowest calibration standard is the lowest concentration for which quantitative data may be reported. Data reported below this level is considered to have less certainty and must be reported as an estimated value using appropriate data qualifiers or explained in a narrative. The highest calibration standard is the highest concentration for which quantitative data may be reported. Data reported above this level is considered to have less certainty and must be reported as an estimated value using appropriate data qualifiers or explained in the narrative. Any specific method requirement for number and type of calibration standards supersedes the general requirement. Instrument and method specific calibration criteria are explained within the specific analytical standard operating procedures for each facility.

6.2.3. Results from all calibration standards analyzed must be included in constructing the calibration curve with the following exceptions:

6.2.3.1. The lowest level calibration standard may be removed from the calibration as long as the remaining number of concentration levels meets the minimum established by the method and standard operating procedure. For multi-parameter methods, this may be done on an individual analyte basis. The reporting limit must be adjusted to the lowest concentration included in the calibration curve;

6.2.3.2. The highest level calibration standard may be removed from the calibration as long as the remaining number of concentration levels meets the minimum established by the method and standard operating procedure. For multi-parameter methods, this may be done an individual analyte basis. The upper limit of quantitation must be adjusted to the highest concentration included in the calibration curve;

6.2.3.3. Multiple points from either the high end or the low end of the calibration curve may be excluded as long as the remaining points are contiguous in nature and the minimum number of levels remains as established by method or standard operating procedure. The reporting limit or quantitation range, whichever is appropriate, must be adjusted accordingly;

6.2.3.4. Results from a concentration level between the lowest and highest calibration levels can only be excluded from an initial calibration curve for a documentable and acceptable cause with approval from the SGM/GM, AGM, or the local SQM/QM. An acceptable cause is defined as an obvious sample introduction issue that resulted in no response or very low response, documentation of an incorrectly prepared standard, or a documented response of a single standard that is more than twice the expected value of that standard. The results for all analytes in the calibration standard are to be excluded and the remaining number of concentration levels must meet the minimum established by the method and standard operating procedure. The excluded interior calibration point may be replaced by re-analysis. Re-analysis of this interior standard should occur within the same 12-hour tune time period for GC/MS methodologies or within 8 hours of the initial analysis of that standard for non-GC/MS methodologies. All samples analyzed prior to the re-analyzed calibration curve point must be re-analyzed after the calibration curve is completed and re-processed against the final calibration curve.

6.2.4. Instrumentation or support equipment that cannot be calibrated to specification or is otherwise defective is clearly labeled as out-of-service until it has been repaired and tested to demonstrate it meets the laboratory's specifications. All repair and maintenance activities including service calls are documented in the maintenance log. Equipment sent off-site for calibration testing is packed and transported to prevent breakage and is in accordance with the calibration laboratory's recommendations.

6.2.5. In the event that recalibration of a piece of test equipment indicates the equipment may have been malfunctioning during the course of sample analysis, an investigation is performed to determine the impact on analytical results. The results of the investigation along with a summary of the information reviewed are documented and maintained by the quality manager. Affected customers must be notified within 30 days after the data investigation is completed and the impact to final results is assessed. Instrumentation found to be consistently out of calibration is either repaired and positively verified or taken out of service and replaced.

6.2.6. Raw data records are retained to document equipment performance. Sufficient raw data is retained to reconstruct the instrument calibration and explicitly connect the continuing calibration verification to the initial calibration.

6.2.7. **General Organic Calibration Procedures**

6.2.7.1. Calibration standards are prepared at a minimum of five concentrations for organic analyses unless otherwise stipulated in the method.

6.2.7.2. Initial calibration curves are evaluated against appropriate statistical models as required by the analytical methods. Curves that do not meet the appropriate criteria require corrective action that may include re-running the initial calibration curve. Rounding to meet initial calibration criteria is not allowed, that is, 15.3 cannot be rounded down to meet a $\leq$ 15% RSD requirement. This also applies to linear and non-linear fit requirements. Whenever possible, initial calibrations are verified with an initial calibration verification standard (ICV) obtained from a second manufacturer or second lot from the same manufacturer if that lot can be demonstrated as prepared independently from other lots prior to the analysis of samples. Sample results are quantitated from the initial calibration unless otherwise required by regulation, method, or program.

6.2.7.3. The calibration curve is periodically verified by the analysis of a mid-level continuing calibration verification (CCV) standard during the course of sample analysis. This standard is from the same source as the initial calibration unless otherwise specified in the source method to be from an alternate source material. Rounding to meet continuing calibration criteria is not allowed. For external standard calibration, continuing calibration verification is performed at the beginning and end of each analytical batch and at intervals within an analytical batch, if required. For internal standard calibration, a verification standard is required at the beginning of the analytical batch , whenever it is expected that the analytical system may be out of calibration, if the time period for calibration has expired, or for analytical systems that have specific calibration verification requirements. For each calibration type, the CCV must meet acceptance criteria in order for sample analysis to proceed.

6.2.7.4. In the event that the CCV does not meet the acceptance criteria, a second CCV may be injected as part of the diagnostic evaluation and corrective action investigation. If the second CCV is acceptable, the analytical sequence may be continued. If both CCVs fail, the analytical sequence is terminated and corrective action is initiated. Sample analysis cannot begin until after documented corrective action has been completed and a method compliant CCV has been analyzed or the instrument has successfully passed a new initial calibration. All samples analyzed since the last compliant CCV are re-analyzed for methodologies utilizing external calibration.

6.2.7.5. When instruments are operating unattended, autosamplers may be programmed to inject consecutive CCVs as a preventative measure against CCV failure with no corrective action. In this case, both CCVs must be evaluated to determine potential impact to the results. A summary of the decision tree and necessary documentation are listed below:

- If both CCVs meet the acceptance criteria, the analytical sequence is allowed to continue without corrective action. The 12 hour clock begins with the injection of the second CCV.
- If the first CCV does not meet the acceptance criteria and the second CCV is acceptable, the analytical sequence is continued and the results are reported.
- If the first CCV meets the acceptance criteria and the second CCV is out of control, the samples after the out of control CCV must be re-analyzed in a compliant analytical sequence.
- If both CCVs are out of control, all samples since the last acceptable CCV must be re-analyzed in a compliant analytical sequence.

6.2.7.6. Some analytical methods require that samples be bracketed by passing CCVs analyzed both before and after the samples. This is specific to each method but, as a general rule, all external calibration methods require bracketing CCVs. Most internal standard calibrations do not require bracketing CCVs.

6.2.7.7. Some analytical methods require verification based on a time interval; some methods require a frequency based on an injection interval. The type and frequency of the calibration verifications is dependent on both the analytical method and possibly on the quality program associated with the samples. The type and frequency of calibration verification will be documented in the method specific SOP employed by each laboratory.

6.2.8. General Inorganic Calibration Procedures

6.2.8.1. The instrument is initially calibrated with standards at multiple concentrations to establish the linearity of the instrument's response. A calibration blank is also included. Initial calibration curves are evaluated against appropriate statistical models as required by the analytical methods. Rounding to meet initial calibration criteria is not allowed. This also applies to linear and non-linear fit requirements. The number of calibration standards used depends on the specific method criteria or customer project requirements, although normally a minimum of three standards is used.

6.2.8.2. The ICP and ICP/MS can be standardized with a zero point and a single point calibration if:

- Prior to analysis, the zero point and the single point calibration are analyzed and a linear range has been established,
- Zero point and single point calibration standards are analyzed with each analytical batch
- A standard corresponding to the LOQ is analyzed with the batch and meets the established acceptance criteria
- The linearity is verified at the frequency established by the method or manufacturer.

6.2.8.3. Whenever possible, initial calibrations are verified with an initial calibration verification standard (ICV) obtained from a second manufacturer or second lot from the same manufacturer if the lot can be demonstrated as prepared independently from other lots prior to the analysis of samples. Sample results are quantitated from the initial calibration unless otherwise required by regulation, method, or program.

6.2.8.4. During the course of analysis, the calibration curve is periodically verified by the analysis of calibration verification standards (CCV). A calibration verification standard is analyzed within each analytical batch at method/program specific intervals to verify that the initial calibration is still valid. The CCV is also analyzed at the end of the analytical batch.

6.2.8.5. A calibration blank is also run with each calibration verification standard to verify the cleanliness of the system. All reported results must be bracketed by acceptable CCVs. Instrument and method specific calibration acceptance criteria are explained within the specific analytical standard operating procedures for each facility.

6.2.8.6. Interference check standards are also analyzed per method requirements and must meet acceptance criteria for metals analyses.

6.3. Support Equipment Calibration Procedures

6.3.1. All support equipment is calibrated or verified at least annually using NIST traceable references over the entire range of use. The results of calibrations or verifications must be within the specifications required or the equipment will be removed from service until repaired. The laboratory maintains records to demonstrate the correction factors applied to working thermometers.

6.3.2. On each day the equipment is used, balances, ovens, refrigerators, freezers, and water baths are checked in the expected use range with NIST traceable references in order to ensure the equipment meets laboratory specifications and these checks are documented appropriately.

6.3.3. **Analytical Balances**

6.3.3.1. Each analytical balance is calibrated or verified at least annually by a qualified service technician. The calibration of each balance is verified each day of use with weights traceable to NIST bracketing the range of use. Calibration weights are ASTM Class 1 or other class weights that have been calibrated against a NIST standard weight and are re-certified every 5 years, at a minimum, against a NIST traceable reference. If balances are calibrated by an external agency, verification of their weights must be available. Balance and weight calibration data are maintained in the Quality department.

6.3.4. **Thermometers and Temperature Sensors**

6.3.4.1. Certified, or reference, thermometers are maintained for checking calibration of working thermometers. Reference thermometers are provided with NIST traceability for initial calibration and are re-certified, at a minimum, every 3 years with equipment directly traceable to NIST.

6.3.4.2. Working thermometers and temperature sensors are compared with the reference thermometers annually according to corporate metrology procedures. Each thermometer or temperature sensor is individually numbered and assigned a correction factor based on the NIST reference source. In addition, working thermometers are visually inspected by laboratory personnel prior to use and temperatures are documented. Working thermometers and/or temperature sensors may also be calibrated by the manufacturer or other qualified vendor.

6.3.4.3. Laboratory thermometer inventory and calibration data are maintained in the Quality department.

6.3.5. **pH/Electrometers**

6.3.5.1. The meter is calibrated before use each day, at a minimum, using fresh buffer solutions.

6.3.6. **Spectrophotometers**

6.3.6.1. During use, spectrophotometer performance is checked at established frequencies in analysis sequences against initial calibration verification (ICV) and continuing calibration verification (CCV) standards.

6.3.7. **Mechanical Volumetric Dispensing Devices**

6.3.7.1. Mechanical volumetric dispensing devices including bottle top dispensers used to dispense critical volumes, pipettes, and burettes, excluding Class A volumetric glassware, are checked for accuracy on a quarterly basis, at a minimum. Glass microliter syringes are considered Class A volumetric glassware.

6.3.7.2. Additional information regarding calibration and maintenance of laboratory support equipment can be found in SOP S-IN-Q-157 *Support Equipment* or its equivalent revision or replacement.

6.4. Instrument/Equipment Maintenance

6.4.1. The objectives of the Pace Analytical maintenance program are twofold: to establish a system of instrument care that maintains instrumentation and equipment at required levels of calibration and sensitivity, and to minimize loss of productivity due to repairs.

6.4.2. The Operations Manager and/or department manager/supervisors are responsible for providing technical leadership to evaluate new equipment, solve equipment problems, and coordinate instrument repair and maintenance. Analysts have the primary responsibility to perform routine maintenance.

6.4.3. To minimize downtime and interruption of analytical work, preventative maintenance is routinely performed on each analytical instrument. Up-to-date instructions on the use and maintenance of equipment are available to staff in the department where the equipment is used.

6.4.4. Department manager/supervisors are responsible for maintaining an adequate inventory of spare parts required to minimize equipment downtime. This inventory includes parts and supplies that are subject to frequent failure, have limited lifetimes, or cannot be obtained in a timely manner should a failure occur.

6.4.5. All major equipment and instrumentation items are uniquely identified to allow for traceability. Equipment/instrumentation is, unless otherwise stated, identified as a system and not as individual pieces. The laboratory maintains equipment records that include the following:

- The name of the equipment and its software
- The manufacturer's name, type, and serial number
- Approximate date received and date placed into service
- Current location in the laboratory
- Condition when received (new, used, etc.)
- Copy of any manufacturer's manuals or instructions
- Dates and results of calibrations and next scheduled calibration (if known)
- Details of past maintenance activities, both routine and non-routine
- Details of any damage, modification or major repairs

6.4.6. All instrument maintenance is documented in maintenance logbooks that are assigned to each particular instrument or system.

6.4.7. The maintenance log entry must include a summary of the issue or error encountered, the maintenance activities performed and an indication that the instrument has been returned to an in-control status. In addition, each entry must include the initials of the analyst making the entry, the dates the maintenance actions were performed, and the date the entry was made in the maintenance logbook, if different from the date(s) of the maintenance.

6.4.8. Any equipment that has been subjected to overloading or mishandling, or that gives suspect results, or has been shown to be defective, is taken out of service and clearly identified. The equipment shall not be used to analyze customer samples until it has been repaired and shown to perform satisfactorily. In the event of instrumentation failure, to avoid hold time issues, the lab may subcontract the affected samples.

7.0. CONTROL OF DATA

Analytical results processing, verification, and reporting are procedures employed that result in the delivery of defensible data. These processes include, but are not limited to, calculation of raw data into final concentration values, review of results for accuracy, evaluation of quality control criteria and assembly of technical reports for delivery to the data user.

All analytical data undergo a well-defined, well-documented multi-tier review process prior to being reported to the customer. This section describes procedures used by PASI for translating raw analytical data into accurate final sample reports as well as PASI data storage policies.

7.1. Analytical Results Processing

7.1.1. When analytical, field, or product testing data is generated, it is either recorded in a bound laboratory logbook or copies of computer-generated printouts that are appropriately labeled and filed. These logbooks and other laboratory records are kept in accordance with each facility's Standard Operating Procedure for documentation storage and archival. If the laboratory chooses to minimize or eliminate its paper usage, data can be recorded and stored on electronic media. In this case, the laboratory must ensure that there are sufficient redundant electronic copies so no data is lost due to unforeseen computer issues.

7.1.2. The primary analyst is responsible for initial data reduction and review. This includes confirming compliance with required methodology, verifying calculations, evaluating quality control data, noting non-conformances in logbooks or as footnotes or narratives, and uploading analytical results into the LIMS. The primary analyst must be clearly identified in all applicable logbooks, spreadsheets and LIMS fields.

7.1.3. The primary analyst then compiles the initial data package for verification. This compilation must include sufficient documentation for data review. It may include standard calibrations, chromatograms, manual integration documentation, electronic printouts, chain of custody forms, and logbook copies.

7.1.4. Some agencies or customers require different levels of data reporting. For these special levels, the primary analyst may need to compile or upload additional project information, such as initial calibration data or extensive spectral data, before the data package proceeds to the verification step.

7.2. Data Verification

7.2.1. Data verification or data validation is the process of examining data and accepting or rejecting it based on pre-defined criteria. This review step is designed to ensure that reported data are free from calculation and transcription errors, that quality control parameters are evaluated, and that any non-conformances are properly documented.

7.2.2. Analysts performing the analysis and subsequent data reduction have primary responsibility for quality of the data produced. The primary analyst initiates the data verification process by reviewing and accepting the data, provided QC criteria have been met for the samples being reported. Data review checklists, either hardcopy or electronic, are used to document the data review process. The primary analyst is responsible for the initial input of the data into the LIMS. The primary analyst and the secondary data reviewer must be clearly identified on all applicable data review checklists.

7.2.3. The completed data package is then sent to a designated qualified secondary data reviewer other than the primary reviewer. The following criteria have been established to qualify someone as a data reviewer. To perform secondary data review, the reviewer must:

7.2.3.1. Have a current Demonstration of Capability (DOC) study on file and have an SOP acknowledgement form on file for the method/procedure being reviewed; or, [See Note]

7.2.3.2. Have a DOC on file for a similar method/technology (i.e., GC/MS) and have an SOP acknowledgment form on file for the method/procedure being reviewed; or, [See Note]

7.2.3.3. Supervise or manage a Department and have an SOP acknowledgment form on file for the method/procedure being reviewed; or,

7.2.3.4. Have significant background in the department/methods being reviewed through education or experience and have an SOP acknowledgment form on file for the method/procedure being reviewed.

7.2.4. **Note:** Secondary reviewer status must be approved by the SQM/QM or SGM/GM/AGM/OM in the event that this person has no prior experience on the specific method or general technology.

7.2.5. This reviewer provides an independent technical assessment of the data and technical review for accuracy according to methods employed and laboratory protocols. This assessment involves a quality control review for use of the proper methodology and detection limits, compliance to quality control protocol and criteria, presence and completeness of required deliverables, and accuracy of calculations and data quantitation. The reviewer validates the data entered into the LIMS and documents approval of manual integrations.

7.2.6. Once the data have been technically reviewed and approved, authorization for release of the data from the analytical section is indicated by initialing and dating the data review checklist or otherwise initialing and dating the data or designating the review of data electronically. The Operations or Project Manager examines the report for method appropriateness, detection limits and QC acceptability. Any deviations from the referenced methods are checked for documentation and validity, and QC corrective actions are reviewed for successful resolution. Alternately, final reports can be set to automatically be delivered to the client by email once the analytical results are final and have been run through the Data Checker program to detect incongruities. This automatic feature is established on a case-by-case basis.

7.2.7. Additional information regarding data review procedures can be found in SOP S-IN-Q-016 *Data Review, Validation and Approval* or its equivalent revision or replacement.

7.2.8. The Data Checker program will process validated data for a given project against a set of pre-determined requirements and known chemistry relationships. The program creates a report that includes a series of warnings and errors for any requirement or condition determined to be suspect or incorrect. These warnings and error counts are displayed on the “Project Inquiry by Client” screen and on the final Data Checker reports. For projects that have any number of warnings or errors, the Data Checker report will provide a message that identifies the source and condition of the error or warning.

7.2.9. Some reports and/or data packages may be reviewed by the QM or SQM or designee based on program requirements or client requirements. In this case a thorough review for completeness and accuracy may include a compilation of raw data and QC summaries in addition to the final report to produce a full deliverable package.

7.3. Data Reporting

7.3.1. Data for each analytical fraction pertaining to a particular PASI project number are delivered to the Project Manager for assembly into the final report. All points mentioned during technical and QC reviews are included in data qualifiers on the final report or in a separate case narrative if there is potential for data to be impacted.

7.3.2. Final reports are prepared according to the level of reporting required by the customer and can be transmitted to the customer via hardcopy or electronic deliverable. A standard PASI final report consists of the following components:

7.3.2.1. A title which designates the report as “Final Report”, “Laboratory Results”, “Certificate of Results”, etc.;

7.3.2.2. Name and address of laboratory and/or subcontractor laboratories, if used;

7.3.2.3. Phone number and name of laboratory contact to where questions can be referred;

7.3.2.4. A unique identification number for the report. The pages of the report shall be numbered and a total number of pages shall be indicated;

7.3.2.5. Name and address of customer and name of project;

7.3.2.6. Unique identification of samples analyzed as well as customer sample IDs;

7.3.2.7. Identification of any sample that did not meet acceptable sampling requirements of the relevant governing agency, such as improper sample containers, holding times missed, sample temperature, etc.;

7.3.2.8. Date and time of collection of samples, date of sample receipt by the laboratory, dates of sample preparation and analysis, and times of sample preparation and analysis when the holding time for either is 72 hours or less;

7.3.2.9. Identification of the test methods used;

7.3.2.10. Identification of sampling procedures if sampling was conducted by the laboratory;

7.3.2.11. Deviations from, additions to, or exclusions from the test methods. These can include failed quality control parameters, deviations caused by the matrix of the sample, etc., and can be shown as a case narrative or as defined data qualifiers to the analytical data;

7.3.2.12. Identification of whether calculations were performed on a dry or wet-weight basis;

7.3.2.13. Reporting limits used;

7.3.2.14. Final results or measurements;

7.3.2.15. A signature and title, electronic or otherwise, of person accepting responsibility for the content of the report;

7.3.2.16. Date report was issued;

7.3.2.17. A statement clarifying that the results of the report relate only to the samples tested or to the samples as they were received by the laboratory;

7.3.2.18. If necessary, a statement indicating that the report must not be reproduced except in full, without the written approval of the laboratory;

7.3.2.19. Identification of all test results provided by a subcontractor laboratory or other outside source;

7.3.2.20. Identification of results obtained outside of quantitation levels.

In addition to the requirements listed above, final reports shall also contain the following items when necessary for the interpretation of results:

7.3.2.21. Deviations from, additions to, or exclusions from the test method, and information on specific test conditions, such as environmental conditions;

7.3.2.22. Where relevant, a statement of compliance/non-compliance with requirements and/or specifications (e.g., the TNI standard);

7.3.2.23. Where applicable, a statement on the estimated uncertainty of measurement; information on uncertainty is needed in test reports when it is relevant to the validity or application of the test results, when a customer's instruction so requires, or when the uncertainty affects compliance to a specification limit;

7.3.2.24. Where appropriate and needed, opinions and interpretations, which may include opinions on the compliance/non-compliance of the results with requirements, fulfillment of contractual requirements, recommendations on how to use the results, and guidance to be used for improvement;

7.3.3. Any changes made to a final report shall be designated as "Revised" or equivalent wording. The laboratory must keep sufficient archived records of all laboratory reports and revisions. For higher levels of data deliverables, a copy of all supporting raw data is sent to the customer along with a final report of results. When possible, the PASI facility will provide electronic data deliverables (EDD) as required by contracts or upon customer request.

7.3.4. Customer data that requires transmission by telephone, telex, facsimile or other electronic means undergoes appropriate steps to preserve confidentiality.

7.3.5. The following positions are the only approved signatories for PASI final reports:

- Senior General Manager
- General Manager
- Assistant General Manager
- Senior Quality Manager
- Quality Manager
- Client Services Manager
- Project Manager
- Project Coordinator

7.4. Data Security

7.4.1. All data including electronic files, logbooks, extraction/digestion/distillation worksheets, calculations, project files and reports, and any other information used to produce the technical report are maintained secured and retrievable by the PASI facility.

7.5. Data Archiving

7.5.1. All records compiled by PASI are maintained legible and retrievable and stored secured in a suitable environment to prevent loss, damage, or deterioration by fire, flood, vermin, theft, and/or environmental deterioration. Records are retained for a minimum of five years unless superseded by federal, state, contractual, and/or accreditation requirements. These records may include, but are not limited to, customer data reports, calibration and maintenance of equipment, raw data from instrumentation, quality control documents, observations, calculations, and logbooks. These records are retained in order to provide for possible historical reconstruction including sampling, receipt, preparation, analysis, and personnel involved. TNI-related records will be made readily available to accrediting authorities. Access to archived data is documented and controlled by the SQM/QM or a designated Data Archivist.

7.5.2. Records that are computer generated have either a hard copy or electronic write protected backup copy. Hardware and software necessary for the retrieval of electronic data is maintained with the applicable records. Archived electronic records are stored protected against electronic and/or magnetic sources.

7.5.3. In the event of a change in ownership, accountability or liability, reports of analyses performed pertaining to accreditation will be maintained by the acquiring entity for a minimum of five years. In the event of bankruptcy, laboratory reports and/or records will be transferred to the customer and/or the appropriate regulatory entity upon request.

7.6. Data Disposal

7.6.1. Data that has been archived for the facility’s required storage time may be disposed of in a secure manner by shredding, returning to customer, or utilizing some other means that does not jeopardize data confidentiality. Records of data disposal will be archived for a minimum of five years unless superseded by federal, contractual, and/or accreditation requirements. Data disposal includes any preliminary or final reports that are disposed.

8.0. QUALITY SYSTEM AUDITS AND REVIEWS

8.1. Internal Audits

8.1.1. Responsibilities

8.1.1.1. The SQM/QM is responsible for designing and/or conducting internal audits in accordance with a predetermined schedule and procedure. Since internal audits represent an independent assessment of laboratory functions, the auditor must be functionally independent from laboratory operations to ensure objectivity. The auditor must be trained, qualified, and familiar enough with the objectives, principles, and procedures of laboratory operations to be able to perform a thorough and effective evaluation. The SQM/QM evaluates audit observations and verifies the completion of corrective actions. In addition, a periodic corporate audit will be conducted. The corporate audits will focus on the effectiveness of the Quality System as outlined in this manual but may also include other quality programs applicable to an individual laboratory.

8.1.2. Scope and Frequency of Internal Audits

8.1.2.1. The complete internal audit process consists of the following four sections:

- Raw Data Review audits- conducted according to a schedule per local SQM/QM. A certain number of these data review audits are conducted per quarter to accomplish this yearly schedule;
- Quality System audits- considered the traditional internal audit function and includes analyst interviews to help determine whether practice matches method requirements and SOP language;
- Final Report reviews;
- Corrective Action Effectiveness Follow-up.

8.1.2.2. Internal systems audits are conducted yearly at a minimum. The scope of these audits includes evaluation of specific analytical departments or a specific quality related system as applied throughout the laboratory.

8.1.2.3. Where the identification of non-conformities or departures cast doubt on the laboratory's compliance with its own policies and procedures, the lab must ensure that the appropriate areas of activity are audited as soon as possible. Examples of system-wide elements that can be audited include:

- Quality Systems documents, such as Standard Operating Procedures, training documents, Quality Assurance Manual, and all applicable addenda
- Data records and non-technical documents
- Personnel and training files.
- General laboratory safety protocols.
- Chemical handling practices, such as labeling of reagents, solutions, and standards as well as all associated documentation.
- Documentation concerning equipment and instrumentation, calibration/maintenance records, operating manuals.
- Sample receipt and management practices.
- Analytical documentation, including any discrepancies and corrective actions.

- General procedures for data security, review, documentation, reporting, and archiving.
- Data integrity issues such as proper manual integrations.

8.1.2.4. When the operations of a specific department are evaluated, a number of additional functions are reviewed including:

- Detection limit studies
- Internal chain of custody documentation, if applicable
- Documentation of standard preparations
- Quality Control limits and Control charts

8.1.2.5. Certain projects may require an internal audit to ensure laboratory conformance to site work plans, sampling and analysis plans, QAPPs, etc.

8.1.2.6. A representative number of data audits are completed annually. Findings from these data audits are handled in the same manner as those from other internal and external audits.

8.1.2.7. The laboratory, as part of their overall internal audit program, ensures that a review is conducted with respect to any evidence of inappropriate actions or vulnerabilities related to data integrity. Discovery and reporting of potential data integrity issues are handled in a confidential manner. All investigations that result in findings of inappropriate activity are fully documented, including the source of the problem, the samples and customers affected the impact on the data, the corrective actions taken by the laboratory, and which final reports had to be re-issued. Customers must be notified within 30 days after the data investigation is completed and the impact to final results is assessed.

8.1.3. Internal Audit Reports and Corrective Action Plans

8.1.3.1. Additional information can be found in SOP S-IN-Q-011 *Internal and External Audits* or its equivalent revision or replacement.

8.1.3.2. A full description of the audit, including the identification of the operation audited, the date(s) on which the audit was conducted, the specific systems examined, and the observations noted are summarized in an internal audit report. Although other personnel may assist with the performance of the audit, the SQM/QM or designee writes and issues the internal audit report identifying which audit observations are deficiencies that require corrective action.

8.1.3.3. When audit findings cast doubt on the effectiveness of the operations or on the correctness of validity of the laboratory's environmental test results, the laboratory will take timely corrective action and notify the customer in writing within three business days, if investigations show that the laboratory results may have been affected.

8.1.3.4. Once completed, the internal audit report is issued jointly to the SGM/GM/AGM/OM and the manager(s)/supervisor(s) of the audited operation at a minimum. The responsible manager(s)/supervisor(s) responds within 14 days with a proposed plan to correct all of the deficiencies cited in the audit report. The SQM/QM may grant additional time for responses to large or complex deficiencies, not to exceed 30 days. Each response must include timetables for completion of all proposed corrective actions.

8.1.3.5. The SQM/QM reviews the audit responses. If the response is accepted, the SQM/QM uses the action plan and timetable as a guideline for verifying completion of the corrective action(s). If the SQM/QM determines that the audit response does not adequately address the correction of cited deficiencies, the response will be returned for modification.

8.1.3.6. To complete the audit process, the SQM/QM performs a re-examination of the areas where deficiencies were found to verify that all proposed corrective actions have been implemented. An audit deficiency is considered closed once implementation of the necessary corrective action has been audited and verified. This is usually within 60-90 days after implementation. If corrective action cannot be verified, the associated deficiency remains open until that action is completed.

8.2. External Audits

8.2.1. PASI laboratories are audited regularly by regulatory agencies to maintain laboratory certifications and by customers to maintain appropriate specific protocols.

8.2.2. Audit teams external to the company review the laboratory to assess the effectiveness of systems and degree of technical expertise. The SQM/QM and other QA staff host the audit team and assist in facilitation of the audit process. Generally, the auditors will prepare a formalized audit report listing deficiencies observed and follow-up requirements for the laboratory. In some cases, items of concern are discussed during a debriefing convened at the end of the on-site review process.

8.2.3. The laboratory staff and supervisors develop corrective action plans to address any deficiencies with the guidance of the SQM/QM. The SGM/GM/AGM/OM provides the necessary resources for staff to develop and implement the corrective action plans. The SQM/QM collates this information and provides a written response to the audit team. The response contains the corrective action plan and expected completion dates for each element of the plan. The SQM/QM follows-up with the laboratory staff to ensure corrective actions are implemented and that the corrective action was effective.

8.3. Quarterly Quality Reports

8.3.1. The SQM/QM is responsible for preparing a quarterly report to management summarizing the effectiveness of the laboratory Quality Systems. This status report will include:

- Overview of quality activities for the quarter
- Certification status
- Proficiency Testing study results
- SOP revision activities
- Internal audit (method/system) findings
- Manual integration audit findings (Mintminer)
- Raw Data and Final Report review findings
- MDL activities
- Other significant Quality System items

8.3.2. The Corporate Director of Quality utilizes the information from each laboratory to make decisions impacting the quality program compliance of the company as a whole. Each

SGM/GM/AGM/OM utilizes the quarterly report information to make decisions impacting Quality Systems and operational systems at a local level.

8.3.3. Additional information can be found in SOP S-ALL-Q-014 *Quarterly Quality Report* or its equivalent revision or replacement.

8.4. Annual Managerial Review

8.4.1. A managerial review of Management and Quality Systems is performed on an annual basis at a minimum. This allows for assessing program effectiveness and introducing changes and/or improvements.

8.4.2. The managerial review must include the following topics of discussion:

- Suitability of quality management policies and procedures
- Manager/Supervisor reports
- Internal audit results
- Corrective and preventive actions
- External assessment results
- Proficiency testing studies
- Sample capacity and scope of work changes
- Customer feedback, including complaints
- Recommendations for improvement,
- Other relevant factors, such as quality control activities, resources, and staffing.

8.4.3. This managerial review must be documented for future reference and copies of the report are distributed to laboratory staff. Results must feed into the laboratory planning system and must include goals, objectives, and action plans for the coming year. The laboratory shall ensure that any actions identified during the review are carried out within an appropriate and agreed upon timeframe.

8.5. Customer Service Reviews

8.5.1. As part of the annual managerial review listed previously, the sales staff is responsible for reporting on customer feedback, including complaints. The acquisition of this information is completed by performing surveys.

8.5.2. The sales staff continually receives customer feedback, both positive and negative, and reports this feedback to the laboratory management in order for them to evaluate and improve their management system, testing activities and customer service.

8.5.3. In addition, the labs must be willing to cooperate with customers or their representatives to clarify customer requests and to monitor the laboratory's performance in relation to the work being performed for the customers. This cooperation may include providing the customer reasonable access to relevant areas of the lab for the witnessing of tests being performed; or the preparation of samples or data deliverables to be used for verification purposes.

8.5.4. Customer service is an important aspect to Pace's overall objective of providing a quality product. Good communication should be provided to customers throughout projects. The lab should inform the customer of any delay or major deviations in the performance of analytical tests.

9.0. CORRECTIVE ACTION

Additional information can be found in SOP S-IN-Q-012 *Corrective and Preventive Actions* or its equivalent revision or replacement.

During the process of sample handling, preparation, and analysis, or during review of quality control records, or during reviews of non-technical portions of the lab, certain occurrences may warrant the need for corrective actions. These occurrences may take the form of analyst errors, deficiencies in quality control, method deviations, or other unusual circumstances. The Quality System of PASI provides systematic procedures for the documentation, monitoring, completion of corrective actions, and follow-up verification of the effectiveness of these corrective actions. This can be done using PASI's LabTrack system that lists among at a minimum, the deficiency by issue number, the deficiency source, responsible party, root cause, resolution, due date, and date resolved.

9.1. Corrective Action Documentation

9.1.1. The following items are examples of sources of laboratory deviations or non-conformances that warrant some form of documented corrective action:

- Internal Laboratory Non-Conformance Trends
- PE/PT Sample Results Not Acceptable
- Internal and External Audits Findings
- Data or Records Review Deficiencies
- Client Complaints
- Client Inquiries
- Holding Time violations

9.1.2. Documentation of corrective actions may be in the form of a comment or qualifier on the final report that explains the deficiency or it may be a more formal documentation. This depends on the extent of the deficiency, the impact on the data, and the method or customer requirements for documentation.

9.1.3. The person who discovers the deficiency or non-conformance initiates the corrective action documentation within LabTrack. The documentation must include the affected projects and sample numbers, the name of the applicable Project Manager, the customer name, and any other pertinent information. The person initiating the corrective action documentation must also list the known causes of the deficiency or non-conformance as well as any corrective/preventative actions that they have taken. Preventive actions must be taken in order to prevent or minimize the occurrence of the situation.

9.1.4. In the event that the laboratory is unable to determine the cause, laboratory personnel and management staff will start a root cause analysis by going through an investigative process. During this process, the following general steps must be taken into account: defining the non-conformance, assigning responsibilities, determining if the condition is significant, and investigating the root cause of the nonconformance. General non-conformance investigative techniques follow the path of the sample through the process looking at each individual step in detail. The root cause must be documented within LabTrack.

9.1.5. After all the documentation is completed, the routing of the LabTrack ticket will continue from the person initiating the corrective action, to their immediate supervisor or the applicable Project

Manager and finally to the SQM/QM or designee, if applicable, who may be responsible for final review and signoff of corrective/preventive actions.

9.1.6. In the event that analytical testing or results do not conform to documented laboratory policies or procedures, customer requirements, or standard specifications, the laboratory shall investigate the significance of the non-conformance and document appropriate corrective actions. The proper level of laboratory management will review any departure from these requirements for technical suitability. These departures are permitted only with the approval of the SGM/GM/AGM/OM or the SQM/QM. Where necessary, Project Management will notify the customer of the situation and will advise of any ramifications to data quality, with the possibility of work being recalled.

9.2. Corrective Action Completion

9.2.1. Internal Laboratory Non-Conformance Trends

9.2.1.1. There are several types of non-conformance trends that may occur in the laboratory that may require the initiation of a corrective action report. Laboratories may choose to initiate a corrective action for all instances of one or more of these categories if they so choose, however the intent is that each of these would be handled according to its severity; one time instances could be handled with a comment or qualifier whereas a systemic problem with any of these categories may require an official corrective action process. These categories, as defined in the Corrective Action SOP are as follows:

- Login error
- Preparation Error
- Contamination
- Calibration Failure
- Internal Standard Failure
- LCS Failure
- Laboratory accident
- Spike Failure
- Instrument Failure
- Final Reporting error
- Data Entry error

9.2.2. PE/PT Sample Results

9.2.2.1. Any PT result assessed as “not acceptable” requires an investigation and applicable corrective actions. The operational staff is made aware of the PT failures and they are responsible for reviewing the applicable raw data and calibrations and list possible causes for error. The SQM/QM reviews their findings and initiates another external PT sample or an internal PT sample to try and correct the previous failure. Replacement PT results must be monitored by the SQM/QM and reported to the applicable regulatory authorities.

9.2.3. Internal and External Audits

9.2.3.1. The SQM/QM is responsible for documenting all audit findings and their corrective actions. This documentation must include the initial finding, the persons responsible for the corrective action, the due date for responding to the auditing body, the root cause of the finding, and the corrective actions needed for resolution. The SQM/QM is also responsible for providing any back-up documentation used to demonstrate that a corrective action has been completed.

9.2.4. Data Review

9.2.4.1. In the course of performing primary and secondary review of data or in the case of raw data reviews (e.g., by the SQM/QM), errors may be found which require corrective actions. Any finding that affects the quality of the data requires some form of corrective action, which may include revising and re-issuing final reports.

9.2.5. Client Complaints

9.2.5.1. Project Managers are responsible for issuing corrective action forms, when warranted, for customer complaints. As with other corrective actions, the possible causes of the problem are listed and the form is passed to the appropriate analyst or supervisor for investigation. After potential corrective actions have been determined, the Project Manager reviews the corrective action form to ensure all customer needs or concerns are being adequately addressed.

9.2.6. Client Inquiries

9.2.6.1. When an error on the customer report is discovered, the Project Manager is responsible for initiating formal corrective action that describes the failure (e.g., incorrect analysis reported, reporting units are incorrect, or reporting limits do not meet objectives). The Project Manager is also responsible for revising the final report if necessary and submitting it to the customer.

9.2.7. Holding Time Violations

9.2.7.1. In the event that a holding time has been missed, the analyst or supervisor must initiate formal corrective action. The Project Manager and the SQM/QM must be made aware of all holding time violations.

9.2.7.2. The Project Manager must contact the customer in order that appropriate decisions are made regarding the hold time excursion and the ultimate resolution is then documented and included in the customer project file.

9.3. Preventive Action Documentation

9.3.1. Pace laboratories can take advantage of several available information sources in order to identify needed improvements in all of their systems including technical, managerial, and quality. These sources may include:

- Management Continuous Improvement Plan (CIP) metrics which are used by all production departments within Pace. When groups compare performance across the company, ways to improve systems may be discovered. These improvements can be made within a department or laboratory-wide.
- Annual managerial reviews- part of this TNI-required and NVLAP-required review is to look at all processes and procedures used by the laboratory over the past year and to determine ways to improve these processes in the future.
- Quality systems reviews- any frequent checks of quality systems (monthly logbook reviews, etc.) can uncover issues that can be corrected or adjusted before they become a larger issue.

9.3.2. When improvement opportunities are identified or if preventive action is required, the laboratory can develop, implement, and monitor preventive action plans.

10.0. GLOSSARY

The source of some of the definitions is indicated previous to the actual definition (e.g., TNI, DoD).

Terms and Definitions	
3P Program	The Pace Analytical continuous improvement program that focuses on Process, Productivity, and Performance. Best Practices are identified that can be used by all PASI labs.
Acceptance Criteria	TNI- Specified limits placed on characteristics of an item, process, or service defined in requirement documents.
Accreditation	TNI- The process by which an agency or organization evaluates and recognizes a laboratory as meeting certain predetermined qualifications or standards, thereby accrediting the laboratory.
Accuracy	TNI- The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations; a data quality indicator.
Aliquot	A discrete, measured, representative portion of a sample taken for analysis.
Analysis	A combination of sample preparation and instrument determination.
Analysis Code (Acode)	All the set parameters of a test, such as Analytes, Method, Detection Limits and Price.
Analysis Sequence	A compilation of all samples, standards and quality control samples run during a specific amount of time on a particular instrument in the order they are analyzed.
Analyst	TNI- The designated individual who performs the “hands-on” analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.
Analyte	The specific chemicals or components for which a sample is analyzed; it may be a group of chemicals that belong to the same chemical family and are analyzed together.
Analytical Uncertainty	TNI- A subset of Measurement Uncertainty that includes all laboratory activities performed as part of the analysis.
Assessment	TNI - The evaluation process used to measure or establish the performance, effectiveness, and conformance of an organization and/or its system to defined criteria (to the standards and requirements of laboratory accreditation).
Atomic Absorption Spectrometer	Instrument used to measure concentration in metals samples.
Atomization	A process in which a sample is converted to free atoms.
Audit	TNI- A systematic and independent examination of facilities, equipment, personnel, training, procedures, record-keeping, data validation, data management, and reporting aspects of a system to determine whether QA/QC and technical activities are being conducted as planned and whether these activities will effectively achieve quality objectives.

Batch	TNI- Environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A **preparation batch** is composed of one to 20 environmental samples of the same quality systems matrix, meeting the above-mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours. An analytical batch is composed of prepared environmental samples (extracts, digestates or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various quality system matrices and can exceed 20 samples.
Bias	TNI- The systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value).
Blank	TNI- A sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usual analytical and measurement process to establish a zero baseline or background value and is sometimes used to adjust or correct routine analytical results.
Blind Sample	A sub-sample for analysis with a composition known to the submitter. The analyst/laboratory may know the identity of the sample but not its composition. It is used to test the analyst's or laboratory's proficiency in the execution of the measurement process.
BNA (Base Neutral Acid compounds)	A list of semi-volatile compounds typically analyzed by mass spectrometry methods. Named for the way they can be extracted out of environmental samples in an acidic, basic or neutral environment.
BOD (Biochemical Oxygen Demand)	Chemical procedure for determining how fast biological organisms use up oxygen in a body of water.
Calibration	TNI- A set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards. 1) In calibration of support equipment, the values realized by standards are established through the use of reference standards that are traceable to the International System of Units (SI); 2) In calibration according to test methods, the values realized by standards are typically established through the use of Reference Materials that are either purchased by the laboratory with a certificate of analysis or purity, or prepared by the laboratory using support equipment that has been calibrated or verified to meet specifications.
Calibration Curve	TNI- The mathematical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response.
Calibration Method	A defined technical procedure for performing a calibration.
Calibration Range	The range of values (concentrations) between the lowest and highest calibration standards of a multi-level calibration curve. For metals analysis with a single-point calibration, the low-level calibration check standard and the high standard establish the linear calibration range, which lies within the linear dynamic range.
Calibration Standard	TNI- A substance or reference material used for calibration.

Certified Reference Material (CRM)	TNI- Reference material accompanied by a certificate, having a value, measurement uncertainty, and stated metrological traceability chain to a national metrology institute.
Chain of Custody	An unbroken trail of accountability that verifies the physical security of samples, data, and records.
Chain of custody Form (COC)	TNI- Record that documents the possession of the samples from the time of collection to receipt in the laboratory. This record generally includes: the number and type of containers; the mode of collection, the collector, time of collection; preservation; and requested analyses.
Chemical Oxygen Demand (COD)	A test commonly used to indirectly measure the amount of organic compounds in water.
Client (referred to by ISO as Customer)	Any individual or organization for whom items or services are furnished or work performed in response to defined requirements and expectations.
Code of Federal Regulations (CFR)	A codification of the general and permanent rules published in the Federal Register by agencies of the federal government.
Comparability	An assessment of the confidence with which one data set can be compared to another. Comparable data are produced through the use of standardized procedures and techniques.
Completeness	The percent of valid data obtained from a measurement system compared to the amount of valid data expected under normal conditions. The equation for completeness is: % Completeness = (Valid Data Points/Expected Data Points)*100
Confirmation	TNI- Verification of the identity of a component through the use of an approach with a different scientific principle from the original method. These may include, but are not limited to: second-column confirmation; alternate wavelength; derivatization; mass spectral interpretation; alternative detectors; or additional cleanup procedures.
Conformance	An affirmative indication or judgment that a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements.
Congener	A member of a class of related chemical compounds (e.g., PCBs, PCDDs).
Consensus Standard	A standard established by a group representing a cross-section of a particular industry or trade, or a part thereof.
Continuing Calibration Blank (CCB)	A blank sample used to monitor the cleanliness of an analytical system at a frequency determined by the analytical method.
Continuing Calibration Check Compounds (CCC)	Compounds listed in mass spectrometry methods that are used to evaluate an instrument calibration from the standpoint of the integrity of the system. High variability would suggest leaks or active sites on the instrument column.
Continuing Calibration Verification	The verification of the initial calibration. Required prior to sample analysis and at periodic intervals. Continuing calibration verification applies to both external and internal standard calibration techniques, as well as to linear and non-linear calibration models.
Continuing Calibration Verification (CCV) Standard	Also referred to as a CVS in some methods, it is a standard used to verify the initial calibration of compounds in an analytical method. CCVs are analyzed at a frequency determined by the analytical method.

Continuous Emission Monitor (CEM)	A flue gas analyzer designed for fixed use in checking for environmental pollutants.
Contract Laboratory Program (CLP)	A national network of EPA personnel, commercial labs, and support contractors whose fundamental mission is to provide data of known and documented quality.
Contract Required Detection Limit (CRDL)	Detection limit that is required for EPA Contract Laboratory Program (CLP) contracts.
Contract Required Quantitation Limit (CRQL)	Quantitation limit (reporting limit) that is required for EPA Contract Laboratory Program (CLP) contracts.
Control Chart	A graphic representation of a series of test results, together with limits within which results are expected when the system is in a state of statistical control (see definition for Control Limit)
Control Limit	A range within which specified measurement results must fall to verify that the analytical system is in control. Control limit exceedances may require corrective action or require investigation and flagging of non-conforming data.
Correction	Action taken to eliminate a detected non-conformity.
Corrective Action	The action taken to eliminate the causes of an existing non-conformity, defect, or other undesirable situation in order to prevent recurrence. A root cause analysis may not be necessary in all cases.
Corrective and Preventative Action (CAPA)	The primary management tools for bringing improvements to the quality system, to the management of the quality system's collective processes, and to the products or services delivered which are an output of established systems and processes.
Customer	Any individual or organization for which products or services are furnished or work performed in response to defined requirements and expectations.
Data Quality Objective (DQO)	Systematic strategic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use or end user.
Data Reduction	TNI- The process of transforming the number of data items by arithmetic or statistical calculation, standard curves, and concentration factors, and collating them into a more usable form.
Definitive Data	Analytical data of known quantity and quality. The levels of data quality on precision and bias meet the requirements for the decision to be made. Data that is suitable for final decision-making.
Demonstration of Capability	TNI- A procedure to establish the ability of the analyst to generate analytical results of acceptable accuracy and precision.
Detection Limit (DL)	The smallest analyte concentration that can be demonstrated to be different than zero or a blank concentration at the 99% confidence. At the DL, the false positive rate (Type 1 error) is 1%. A DL may be used as the lowest concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence.
Diesel Range Organics (DRO)	A range of compounds that denote all the characteristic compounds that make up diesel fuel (range can be state or program specific).
Digestion	A process in which a sample is treated (usually in conjunction with heat and acid) to convert the sample to a more easily measured form.

Document Control	The act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.
Documents	Written components of the laboratory management system (e.g., policies, procedures, and instructions).
Dry Weight	The weight after drying in an oven at a specified temperature.
Duplicate (also known as Replicate or Laboratory Duplicate)	The analyses or measurements of the variable of interest performed identically on two subsamples of the same sample. The results of duplicate analyses are used to evaluate analytical or measurement precision but not the precision of sampling, preservation or storage internal to the laboratory.
Electron Capture Detector (ECD)	Device used in GC methods to detect compounds that absorb electrons (e.g., PCB compounds).
Electronic Data Deliverable (EDD)	A summary of environmental data (usually in spreadsheet form) which clients request for ease of data review and comparison to historical results.
Eluent	A solvent used to carry the components of a mixture through a stationary phase.
Elute	To extract, specifically, to remove (absorbed material) from an absorbent by means of a solvent.
Elution	A process in which solutes are washed through a stationary phase by movement of a mobile phase.
Environmental Data	Any measurements or information that describe environmental processes, locations, or conditions; ecological or health effects and consequences; or the performance of environmental technology.
Environmental Monitoring	The process of measuring or collecting environmental data.
Environmental Sample	A representative sample of any material (aqueous, non-aqueous, or multimedia) collected from any source for which determination of composition or contamination is requested or required. Environmental samples can generally be classified as follows: • Non Potable Water (Includes surface water, ground water, effluents, water treatment chemicals, and TCLP leachates or other extracts) • Drinking Water - Delivered (treated or untreated) water designated as potable water • Water/Wastewater - Raw source waters for public drinking water supplies, ground waters, municipal influents/effluents, and industrial influents/effluents • Sludge - Municipal sludges and industrial sludges. • Soil - Predominately inorganic matter ranging in classification from sands to clays. • Waste - Aqueous and non-aqueous liquid wastes, chemical solids, and industrial liquid and solid wastes
Equipment Blank	A sample of analyte-free media used to rinse common sampling equipment to check effectiveness of decontamination procedures.
Facility	A distinct location within the company that has unique certifications, personnel and waste disposal identifications.

False Negative	A result that fails to identify (detect) an analyte or reporting an analyte to be present at or below a level of interest when the analyte is actually above the level of interest.
False Positive	A result that erroneously identifies (detects) an analyte or reporting an analyte to be present above a level of interest when the analyte is actually present at or below the level of interest.
Field Blank	A blank sample prepared in the field by filling a clean container with reagent water and appropriate preservative, if any, for the specific sampling activity being undertaken.
Field Measurement	Determination of physical, biological, or radiological properties, or chemical constituents that are measured on-site, close in time and space to the matrices being sampled/measured, following accepted test methods. This testing is performed in the field outside of a fixed-laboratory or outside of an enclosed structure that meets the requirements of a mobile laboratory.
Field of Accreditation	TNI- Those matrix, technology/method, and analyte combinations for which the accreditation body offers accreditation.
Finding	TNI- An assessment conclusion referenced to a laboratory accreditation standard and supported by objective evidence that identifies a deviation from a laboratory accreditation standard requirement.
Flame Atomic Absorption Spectrometer (FAA)	Instrumentation used to measure the concentration of metals in an environmental sample based on the fact that ground state metals absorb light at different wavelengths. Metals in a solution are converted to the atomic state by use of a flame.
Flame Ionization Detector (FID)	A type of gas detector used in GC analysis where samples are passed through a flame which ionizes the sample so that various ions can be measured.
Gas Chromatography (GC)	Instrumentation which utilizes a mobile carrier gas to deliver an environmental sample across a stationary phase with the intent to separate compounds out and measure their retention times.
Gas Chromatograph/ Mass Spectrometry (GC/MS)	In conjunction with a GC, this instrumentation utilizes a mass spectrometer which measures fragments of compounds and determines their identity by their fragmentation patterns (mass spectra).
Gasoline Range Organics (GRO)	A range of compounds that denote all the characteristic compounds that make up gasoline (range can be state or program specific).
Graphite Furnace Atomic Absorption Spectrometry (GFAA)	Instrumentation used to measure the concentration of metals in an environmental sample based on the absorption of light at different wavelengths that are characteristic of different analytes.
High Pressure Liquid Chromatography (HPLC)	Instrumentation used to separate, identify and quantitate compounds based on retention times which are dependent on interactions between a mobile phase and a stationary phase.
Holding Time	TNI- The maximum time that can elapse between two specified activities. 40 CFR Part 136- The maximum time that samples may be held prior to preparation and/or analysis as defined by the method and still be considered valid or not compromised. For sample prep purposes, hold times are calculated using the time of the start of the preparation procedure.
Homogeneity	The degree to which a property or substance is uniformly distributed throughout a sample.

Homologue	One in a series of organic compounds in which each successive member has one more chemical group in its molecule than the next preceding member. For instance, methanol, ethanol, propanol, butanol, etc., form a homologous series.
Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	Analytical technique used for the detection of trace metals which uses plasma to produce excited atoms that emit radiation of characteristic wavelengths.
Inductively Coupled Plasma- Mass Spectrometry (ICP/MS)	An ICP-AES that is used in conjunction with a mass spectrometer so that the instrument is not only capable of detecting trace amounts of metals and non-metals but is also capable of monitoring isotopic speciation for the ions of choice.
Infrared Spectrometer (IR)	An instrument that uses infrared light to identify compounds of interest.
Initial Calibration (ICAL)	The process of analyzing standards, prepared at specified concentrations, to define the quantitative response relationship of the instrument to the analytes of interest. Initial calibration is performed whenever the results of a calibration verification standard do not conform to the requirements of the method in use or at a frequency specified in the method.
Initial Calibration Blank (ICB)	A blank sample used to monitor the cleanliness of an analytical system at a frequency determined by the analytical method. This blank is specifically run in conjunction with the Initial Calibration Verification (ICV) where applicable.
Initial Calibration Verification (ICV)	Verifies the initial calibration with a standard obtained or prepared from a source independent of the source of the initial calibration standards to avoid potential bias of the initial calibration.
Instrument Blank	A clean sample (e.g., distilled water) processed through the instrumental steps of the measurement process; used to determine instrument contamination.
Instrument Detection Limits (IDLs)	Limits determined by analyzing a series of reagent blank analyses to obtain a calculated concentration. IDLs are determined by calculating the average of the standard deviations of three runs on three non-consecutive days from the analysis of a reagent blank solution with seven consecutive measurements per day.
Interference, spectral	Occurs when particulate matter from the atomization scatters incident radiation from the source or when the absorption or emission from an interfering species either overlaps or is so close to the analyte wavelength that resolution becomes impossible.
Interference, chemical	Results from the various chemical processes that occur during atomization and later the absorption characteristics of the analyte.
Internal Standards	TNI- A known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method.
Intermediate Standard Solution	Reference solutions prepared by dilution of the stock solutions with an appropriate solvent.
International System of Units (SI)	The coherent system of units adopted and recommended by the General Conference on Weights and Measures.
Ion Chromatography (IC)	Instrumentation or process that allows the separation of ions and molecules based on the charge properties of the molecules.

Isomer	One of two or more compounds, radicals, or ions that contain the same number of atoms of the same element but differ in structural arrangement and properties. For example, hexane (C6H14) could be n-hexane, 2-methylpentane, 3-methylpentane, 2,3-dimethylbutane, 2,2-dimethylbutane.
Laboratory	A body that calibrates and/or tests.
Laboratory Control Sample (LCS)	TNI- (however named, such as laboratory fortified blank (LFB), spiked blank, or QC check sample): A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes and taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a reference method. It is generally used to establish intra-laboratory or analyst-specific precision and bias or to evaluate the performance of all or a portion of the measurement system.
Laboratory Duplicate	Aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently.
Laboratory Information Management System (LIMS)	The entirety of an electronic data system (including hardware and software) that collects, analyzes, stores, and archives electronic records and documents.
LabTrack	Database used by Pace Analytical to store and track corrective actions and other laboratory issues.
Learning Management System (LMS)	A web-based database used by the laboratories to track and document training activities. The system is administered by the corporate training department and each laboratory's learn centers are maintained by a local administrator.
Legal Chain-of-Custody Protocols	TNI- Procedures employed to record the possession of samples from the time of sampling through the retention time specified by the client or program. These procedures are performed at the special request of the client and include the use of a Chain-of-Custody (COC) Form that documents the collection, transport, and receipt of compliance samples by the laboratory. In addition, these protocols document all handling of the samples within the laboratory.
Limit(s) of Detection (LOD)	TNI- A laboratory's estimate of the minimum amount of an analyte in a given matrix that an analytical process can reliably detect in their facility.
Limit(s) of Quantitation (LOQ)	TNI- The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence.
Linear Dynamic Range	Concentration range where the instrument provides a linear response.
Liquid chromatography/ tandem mass spectrometry (LC/MS/MS)	Instrumentation that combines the physical separation techniques of liquid chromatography with the mass analysis capabilities of mass spectrometry.
Lot	A quantity of bulk material of similar composition processed or manufactured at the same time.
Management	Those individuals directly responsible and accountable for planning, implementing, and assessing work.
Management System	System to establish policy and objectives and to achieve those objectives.

Manager (however named)	The individual designated as being responsible for the overall operation, all personnel, and the physical plant of the environmental laboratory. A supervisor may report to the manager. In some cases, the supervisor and the manager may be the same individual.
Matrix	TNI- The substrate of a test sample.
Matrix Duplicate	TNI- A replicate matrix prepared in the laboratory and analyzed to obtain a measure of precision.
Matrix Spike (MS) (spiked sample or fortified sample)	TNI- A sample prepared, taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a referenced method, by adding a known amount of target analyte to a specified amount of sample for which an independent test result of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method’s recovery efficiency.
Matrix Spike Duplicate (MSD) (spiked sample or fortified sample duplicate)	TNI- A replicate matrix spike prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte.
May	EPA – The word “may” is used to provide guidance on aspects of the method that are useful but not essential.
Measurement Performance Criteria (MPC)	Criteria that may be general (such as completion of all tests) or specific (such as QC method acceptance limits) that are used by a project to judge whether a laboratory can perform a specified activity to the defined criteria.
Measurement System	TNI- A test method, as implemented at a particular laboratory, and which includes the equipment used to perform the sample preparation, test and the operator(s).
Measurement Uncertainty	An estimate of the error in a measurement often stated as a range of values that contain the true value, within a certain confidence level. The uncertainty generally includes many components which may be evaluated from experimental standard deviations based on repeated observations or by standard deviations evaluated from assumed probability distributions based on experience or other information. For DoD/DOE, a laboratory’s Analytical Uncertainty (such as use of LCS control limits) can be reported as the minimum uncertainty.
Method	TNI- A body of procedures and techniques for performing an activity (e.g., sampling, chemical analysis, quantification), systematically presented in the order in which they are to be executed.
Method Blank	TNI- A sample of a matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses.
Method Detection Limit (MDL)	One way to establish a Detection Limit; defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Method of Standard Additions	A set of procedures adding one or more increments of a standard solution to sample aliquots of the same size in order to overcome inherent matrix effects. The procedures encompass the extrapolation back to obtain the sample concentration.
MintMiner	Program used by Pace Analytical to review large amounts of chromatographic data to monitor for errors or data integrity issues.
Mobile Laboratory	TNI- A portable enclosed structure with necessary and appropriate accommodation and environmental conditions for a laboratory, within which testing is performed by analysts. Examples include but are not limited to trailers, vans, and skid-mounted structures configured to house testing equipment and personnel.
Must	EPA – The word “must” is used to indicate aspects of the method that are considered essential to its performance, based on sound analytical practices.
National Institute of Standards and Technology (NIST)	TNI- A federal agency of the US Department of Commerce’s Technology Administration that is designed as the United States national metrology institute (or NMI).
National Pollutant Discharge Elimination System (NPDES)	A permit program that controls water pollution by regulating point sources that discharge pollutants into U.S. waters.
Negative Control	Measures taken to ensure that a test, its components, or the environment do not cause undesired effects, or produce incorrect test results.
Nitrogen Phosphorus Detector (NPD)	A detector used in GC analyses that utilizes thermal energy to ionize an analyte. With this detector, nitrogen and phosphorus can be selectively detected with a higher sensitivity than carbon.
Nonconformance	An indication or judgment that a product or service has not met the requirement of the relevant specifications, contract, or regulation; also the state of failing to meet the requirements.
Not Detected (ND)	The result reported for a compound when the detected amount of that compound is less than the method reporting limit.
Performance Based Measurement System (PBMS)	An analytical system wherein the data quality needs, mandates or limitations of a program or project are specified and serve as criteria for selecting appropriate test methods to meet those needs in a cost-effective manner.
Photo-ionization Detector (PID)	An ion detector which uses high-energy photons, typically in the ultraviolet range, to break molecules into positively charged ions.
Polychlorinated Biphenyls (PCB)	A class of organic compounds that were used as coolants and insulating fluids for transformers and capacitors. The production of these compounds was banned in the 1970’s due to their high toxicity.
Positive Control	Measures taken to ensure that a test and/or its components are working properly and producing correct or expected results from positive test subjects.
Post-Digestion Spike	A sample prepared for metals analyses that has analytes spike added to determine if matrix effects may be a factor in the results.
Power of Hydrogen (pH)	The measure of acidity or alkalinity of a solution.
Practical Quantitation Limit (PQL)	Another term for a method reporting limit. The lowest reportable concentration of a compound based on parameters set up in an analytical method and the laboratory’s ability to reproduce those conditions.

Precision	TNI- The degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed as standard deviation, variance or range, in either absolute or relative terms.
Preservation	TNI- Any conditions under which a sample must be kept in order to maintain chemical, physical, and/or biological integrity prior to analysis.
Procedure	TNI- A specified way to carry out an activity or process. Procedures can be documented or not.
Proficiency Testing	TNI- A means of evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source.
Proficiency Testing Program	TNI- The aggregate of providing rigorously controlled and standardized environmental samples to a laboratory for analysis, reporting of results, statistical evaluation of the results and the collective demographics and results summary of all participating laboratories.
Proficiency Testing Sample (PT)	TNI- A sample, the composition of which is unknown to the laboratory and is provided to test whether the laboratory can produce analytical results within the specified acceptance criteria.
Protocol	TNI- A detailed written procedure for field and/or laboratory operation (e.g., sampling, analysis) that must be strictly followed.
Qualitative Analysis	Analysis designed to identify the components of a substance or mixture.
Quality Assurance (QA)	TNI- An integrated system of management activities involving planning, implementation, assessment, reporting and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the client.
Quality Assurance Manual (QAM)	A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users.
Quality Assurance Project Plan (QAPP)	A formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.
Quality Control (QC)	TNI- The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality; also the system of activities and checks used to ensure that measurement systems are maintained within prescribed limits, providing protection against "out of control" conditions and ensuring that the results are of acceptable quality.
Quality Control Sample (QCS)	TNI- A sample used to assess the performance of all or a portion of the measurement system. One of any number of samples, such as Certified Reference Materials, a quality system matrix fortified by spiking, or actual samples fortified by spiking, intended to demonstrate that a measurement system or activity is in control.
Quality Manual	TNI- A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users.

Quality System	TNI- A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance and quality control activities.
Quality System Matrix	TNI- These matrix definitions are to be used for purposes of batch and quality control requirements: • **Air and Emissions**: Whole gas or vapor samples including those contained in flexible or rigid wall containers and the extracted concentrated analytes of interest from a gas or vapor that are collected with a sorbant tube, impinger solution, filter, or other device • **Aqueous**: Any aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine. Includes surface water, groundwater effluents, and TCLP or other extracts. • **Biological Tissue**: Any sample of a biological origin such as fish tissue, shellfish or plant material. Such samples shall be grouped according to origin. • **Chemical Waste**: A product or by-product of an industrial process that results in a matrix not previously defined. • **Drinking Water**: Any aqueous sample that has been designated a potable or potentially potable water source. • **Non-aqueous liquid**: Any organic liquid with <15% settleable solids • **Saline/Estuarine**: Any aqueous sample from an ocean or estuary, or other salt water source such as the Great Salt Lake. • **Solids**: Includes soils, sediments, sludges, and other matrices with >15% settleable solids.
Quantitation Range	The range of values (concentrations) in a calibration curve between the LOQ and the highest successively analyzed initial calibration standard. The quantitation range lies within the calibration range.
Quantitative Analysis	Analysis designed to determine the amounts or proportions of the components of a substance.
Random Error	The EPA has established that there is a 5% probability that the results obtained for any one analyte will exceed the control limits established for the test due to random error. As the number of compounds measured increases in a given sample, the probability for statistical error also increases.
Raw Data	TNI- The documentation generated during sampling and analysis. This documentation includes, but is not limited to, field notes, electronic data, magnetic tapes, untabulated sample results, QC sample results, print outs of chromatograms, instrument outputs, and handwritten records.
Reagent Blank (method reagent blank)	A sample consisting of reagent(s), without the target analyte or sample matrix, introduced into the analytical procedure at the appropriate point and carried through all subsequent steps to determine the contribution of the reagents and of the involved analytical steps.

Reagent Grade	Analytical reagent (AR) grade, ACS reagent grade, and reagent grade are synonymous terms for reagents that conform to the current specifications of the Committee on Analytical Reagents of the American Chemical Society.
Records	The output of implementing and following management system documents (e.g., test data in electronic or hand-written forms, files, and logbooks).
Reference Material	TNI- Material or substance one or more of whose property values are sufficiently homogenized and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.
Reference Standard	TNI- Standard used for the calibration of working measurement standards in a given organization or at a given location.
Relative Percent Difference (RPD)	A measure of precision defined as the difference between two measurements divided by the average concentration of the two measurements.
Reporting Limit (RL)	The level at which method, permit, regulatory and customer-specific objectives are met. The reporting limit may never be lower than the Limit of Detection (i.e., statistically determined MDL). Reporting limits are corrected for sample amounts, including the dry weight of solids, unless otherwise specified. There must be a sufficient buffer between the Reporting Limit and the MDL.
Reporting Limit Verification Standard (or otherwise named)	A standard analyzed at the reporting limit for an analysis to verify the laboratory's ability to report to that level.
Representativeness	A quality element related to the ability to collect a sample reflecting the characteristics of the part of the environment to be assessed. Sample representativeness is dependent on the sampling techniques specified in the project work plan.
Requirement	Denotes a mandatory specification; often designated by the term "shall".
Retention Time	The time between sample injection and the appearance of a solute peak at the detector.
Sample	Portion of material collected for analysis, identified by a single, unique alphanumeric code. A sample may consist of portions in multiple containers, if a single sample is submitted for multiple or repetitive analysis.
Sample Condition Upon Receipt Form (SCURF)	Form used by Pace Analytical sample receiving personnel to document the condition of sample containers upon receipt to the laboratory (used in conjunction with a COC).
Sample Delivery Group (SDG)	A unit within a single project that is used to identify a group of samples for delivery. An SDG is a group of 20 or fewer field samples within a project, received over a period of up to 14 calendar days. Data from all samples in an SDG are reported concurrently.
Sample Receipt Form (SRF)	Letter sent to the client upon login to show the tests requested and pricing.
Sample Tracking	Procedures employed to record the possession of the samples from the time of sampling until analysis, reporting and archiving. These procedures include the use of a Chain of custody Form that documents the collection, transport, and receipt of compliance samples to the laboratory. In addition, access to the laboratory is limited and controlled to protect the integrity of the samples.
Sampling	TNI- Activity related to obtaining a representative sample of the object of conformity assessment, according to a procedure.

Selective Ion Monitoring (SIM)	A mode of analysis in mass spectrometry where the detector is set to scan over a very small mass range, typically one mass unit. The narrower the range, the more sensitive the detector.
Selectivity	TNI- The ability to analyze, distinguish, and determine a specific analyte or parameter from another component that may be a potential interferent or that may behave similarly to the target analyte or parameter within the measurement system.
Sensitivity	TNI- The capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest.
Serial Dilution	The stepwise dilution of a substance in a solution.
Shall	EPA – The word "shall" is used to indicate aspects of the method that are considered essential to its performance, based on sound analytical practices.
Should	EPA – The word "should" is used to provide guidance on aspects of the method that are useful but not essential.
Signal-to-Noise Ratio (S/N)	S/N is a measure of signal strength relative to background noise. The average strength of the noise of most measurements is constant and independent of the magnitude of the signal. Thus, as the quantity being measured (producing the signal) decreases in magnitude, S/N decreases and the effect of the noise on the relative error of a measurement increases.
Spike	A known mass of target analyte added to a blank sample or sub-sample; used to determine recovery efficiency or for other quality control purposes.
Standard (Document)	TNI- The document describing the elements of a laboratory accreditation that has been developed and established within the consensus principles of standard setting and meets the approval requirements of standard adoption organizations procedures and policies.
Standard (Chemical)	Standard samples are comprised of a known amount of standard reference material in the matrix undergoing analysis. A standard reference material is a certified reference material produced by US NIST and characterized for absolute content, independent of analytical test method.
Standard Blank (or Reagent Blank)	A calibration standard consisting of the same solvent/reagent matrix used to prepare the calibration standards without the analytes. It is used to construct the calibration curve by establishing instrument background.
Standard Method	A test method issued by an organization generally recognized as competent to do so.
Standard Operating Procedure (SOP)	TNI- A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps. SOPs are officially approved as the methods for performing certain routine or repetitive tasks.
Standard Reference Material (SRM)	A certified reference material produced by the US NIST or other equivalent organization and characterized for absolute content, independent of analytical method.
Statement of Qualifications (SOQ)	A document that lists information about a company, typically the qualifications of that company to compete on a bid for services.
Stock Standard	A concentrated reference solution containing one or more analytes prepared in the laboratory using an assayed reference compound or purchased from a reputable commercial source.

Storage Blank	A sample of analyte-free media prepared by the laboratory and retained in the sample storage area of the laboratory. A storage blank is used to record contamination attributable to sample storage at the laboratory.
Supervisor	The individual(s) designated as being responsible for a particular area or category of scientific analysis. This responsibility includes direct day-to-day supervision of technical employees, supply and instrument adequacy and upkeep, quality assurance/quality control duties and ascertaining that technical employees have the required balance of education, training and experience to perform the required analyses.
Surrogate	A substance with properties that mimic the analyte of interest. It is unlikely to be found in environment samples and is added to them for quality control purposes.
Systems Audit	An on-site inspection or assessment of a laboratory's quality system.
Target Analytes	Analytes or chemicals of primary concern, identified by the customer on a project-specific basis.
Technical Director	Individual(s) who has overall responsibility for the technical operation of the environmental testing laboratory.
Technology	TNI- A specific arrangement of analytical instruments, detection systems, and/or preparation techniques.
Test	A technical operation that consists of the determination of one or more characteristics or performance of a given product, material, equipment, organism, physical phenomenon, process or service according to a specified procedure. The result of a test is normally recorded in a document sometimes called a test report or a test certificate.
Test Method	A definitive procedure that determines one or more characteristics of a given substance or product.
Test Methods for Evaluating Solid Waste, Physical/ Chemical (SW-846)	EPA Waste's official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with RCRA regulations.
Total Petroleum Hydrocarbons (TPH)	A term used to denote a large family of several hundred chemical compounds that originate from crude oil. Compounds may include gasoline components, jet fuel, volatile organics, etc.
Toxicity Characteristic Leaching Procedure (TCLP)	A solid sample extraction method for chemical analysis employed as an analytical method to simulate leaching of compounds through a landfill.
Traceability	TNI- The ability to trace the history, application, or location of an entity by means of recorded identifications. In a calibration sense, traceability relates measuring equipment to national or international standards, primary standards, basic physical conditions or properties, or reference materials. In a data collection sense, it relates calculations and data generated throughout the project back to the requirements for the quality of the project.
Training Document	A training resource that provides detailed instructions to execute a specific method or job function.

Trip Blank	This blank sample is used to detect sample contamination from the container and preservative during transport and storage of the sample. A cleaned sample container is filled with laboratory reagent water and the blank is stored, shipped, and analyzed with its associated samples.
Tuning	A check and/or adjustment of instrument performance for mass spectrometry as required by the method.
Ultraviolet Spectrophotometer (UV)	Instrument routinely used in quantitative determination of solutions of transition metal ions and highly conjugated organic compounds.
Uncertainty Measurement	The parameter associated with the result of a measurement that characterized the dispersion of the values that could be reasonably attributed to the measurand (i.e. the concentration of an analyte).
Unethical actions	Deliberate falsification of analytical or quality control results, where failed method or contractual requirements are made to appear acceptable.
Validation	The confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled.
Verification	TNI- Confirmation by examination and objective evidence that specified requirements have been met. Note: In connection with the management of measuring equipment, verification provides a means for checking that the deviations between values indicated by a measuring instrument and corresponding known values of a measured quantity are consistently smaller than the maximum allowable error defined in a standard, regulation or specification peculiar to the management of the measuring equipment. The result of verification leads to a decision either to restore in service, to perform adjustment, to repair, to downgrade, or to declare obsolete. In all cases, it is required that a written trace of the verification performed shall be kept on the measuring instrument's individual record.
Whole Effluent Toxicity (WET)	The aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater (effluent).

11.0. REFERENCES

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11.20. TNI (The NELAC Institute) Standards; most recent version.

11.21. UCMR3 Laboratory Approval Requirements and Information Document, version 2.0, January 2012.

12.0. REVISIONS

The PASI Corporate Quality Office files both a paper copy and electronic version of a Microsoft Word document with tracked changes detailing all revisions made to the previous version of the Quality Assurance Manual. This document is available upon request. All revisions are summarized in the table below.

Document Number	**Reason for Change**	**Date**
Quality Assurance Manual 17.0	For Indy version: removed all DoD and Ohio VAP references. Cover page: added AGM signature line Section 1.8.4: added QAPP and data review responsibilities. Section 1.8.5: added data and package review responsibilities. Section 1.8.9: added login and SRF review responsibilities. Section 1.8.11: added training responsibilities. Section 1.8.16: removed some responsibilities. Section 1.8.16: changed Management to Receiving and added some responsibilities Section 1.12.2: changed Management to Receiving and added Dept. Manager as responsible party Section 2.1: added “may provide basic sample collection.” Section 2.5.4: removed residual chlorine check Section 2.6.5: Updated facility codes. Removed Columbus. Section 3.3: added instrument validation information Section 4.2.5: revised language for LCS high and no sample hits. Section 4.3.2: added “when sample volume/weight is available.” Section 4.5.2: added “most” organic analyses. Section 4.7.1: added that field blanks are processed as routine samples. Section 4.8.1: added that trip blanks are processed as routine samples. Section 4.10.1: reworded some language for clarity. Section 4.14.1: revised language to match 8000C. Section 5.1.5: revised language to match practice. Section 6.1.4: revised language to match practice. Section 6.2.3.4: Reworded language regarding calibrations. Revised language to match 8000C. Section 6.2.7.4: changed 2 CCVs to a method-compliant CCV. Section 6.3.4: added temperature sensors. Section 6.3.7.1: Removed last sentence about syringes. Added syringes as Class A glassware. Section 6.4.7: revised language to match maintenance log sections. Section 6.4.8: Added sentence about instrumentation failure. Section 7.2.6: Added language regarding auto email function. Section 7.5.1.1: Added red letter section for special data retention requirements. Section 9.2.7.2: Removed sentence regarding hold time reporting by QMs. Section 10: Updated DoD definitions per DoD/DOE QSM, revision 5.0. Also added definitions for LC/MS/MS and UCMR. Added definitions for “may” and “must”, revised “should” and “shall.” Section 11: Revised DoD reference and added UCMR3 reference. Attachment VIII: added several drinking water methods and added note 4 regarding hexavalent holding time and preservation.	13Oct2014

ATTACHMENT I- QUALITY CONTROL CALCULATIONS

PERCENT RECOVERY (%REC)

$$\%REC = \frac{(MSConc - SampleConc)}{TrueValue} * 100$$

NOTE: The SampleConc is zero (0) for theLCS and Surrogate Calculations

PERCENT DIFFERENCE (%D)

$$\%D = \frac{MeasuredValue - TrueValue}{TrueValue} * 100$$

where:
TrueValue = Amount spiked (can also be the $\overline{\text{CF}}$ or $\overline{\text{RF}}$ of the ICAL Standards)
Measured Value = Amount measured (can also be the CF or RF of the CCV)

PERCENT DRIFT

$$\%Drift = \frac{CalculatedConcentration - TheoreticalConcentration}{TheoreticalConcentrtion} * 100$$

RELATIVE PERCENT DIFFERENCE (RPD)

$$RPD = \frac{|(R1 - R2)|}{(R1 + R2)/2} * 100$$

where:
R1 = Result Sample 1
R2 = Result Sample 2

CORRELATION COEFFICIENT (R)

$$CorrCoeff = \frac{\sum_{i=1}^{N} W_i * (X_i - \overline{X}) * (Y_i - \overline{Y})}{\sqrt{\left(\sum_{i=1}^{N} W_i * (X_i - \overline{X})^2\right) * \left(\sum_{i=1}^{N} W_i * (Y_i - \overline{Y})^2\right)}}$$

With:

With:	N	Number of standard samples involved in the calibration
	i	Index for standard samples
	Wi	Weight factor of the standard sample no. i
	Xi	X-value of the standard sample no. i
	X(bar)	Average value of all x-values
	Yi	Y-value of the standard sample no. i
	Y(bar)	Average value of all y-values

ATTACHMENT I- QUALITY CONTROL CALCULATIONS (CONTINUED)

STANDARD DEVIATION (S)

$$S = \sqrt{\sum_{i=1}^{n} \frac{(X_i - \overline{X})^2}{(n-1)}}$$

where:
n = number of data points
X_i = individual data point
$\overline{X}$ = average of all data points

AVERAGE ($\overline{X}$)

$$\overline{X} = \frac{\sum_{n=1}^{i} X_i}{n}$$

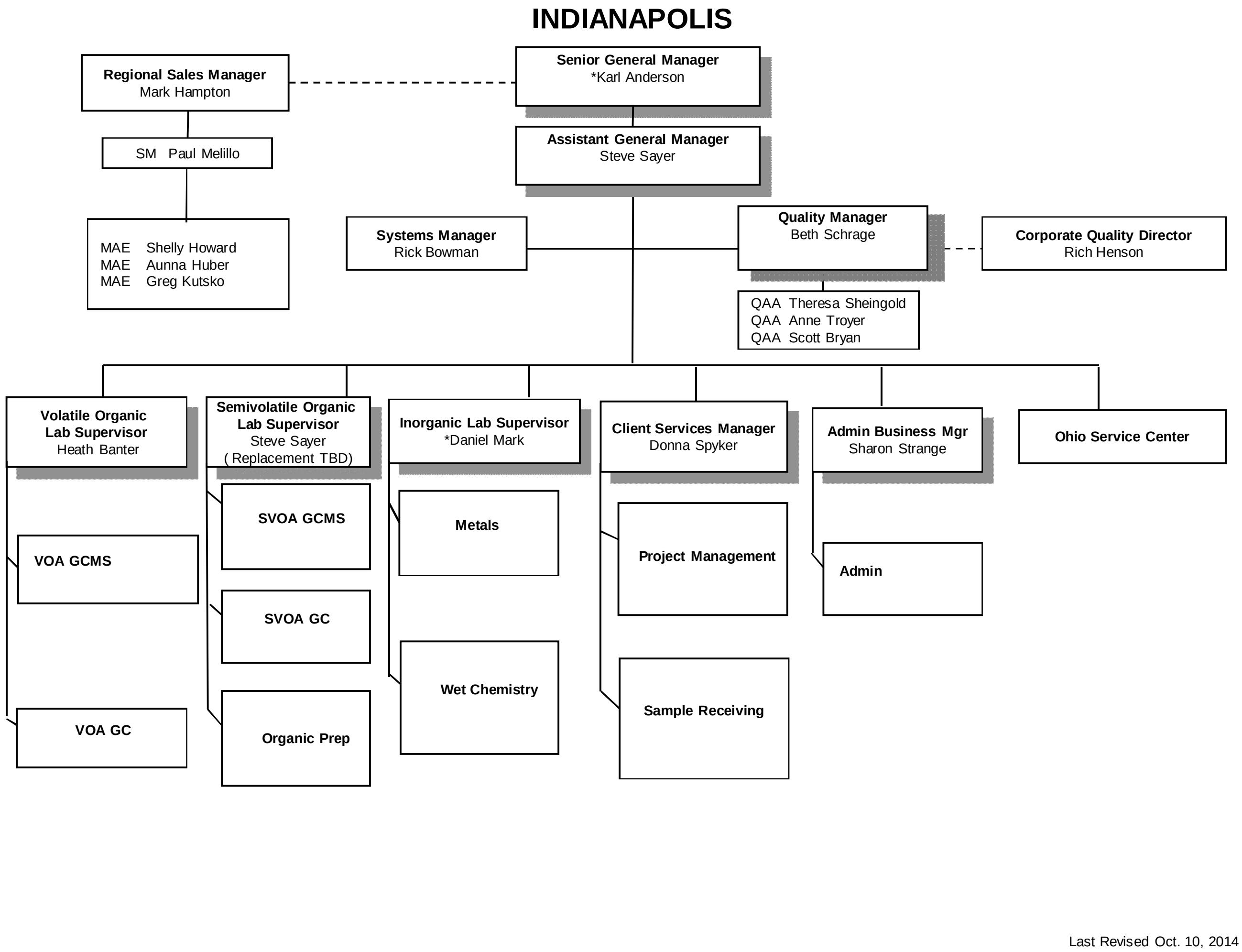
where:
n = number of data points
X_i = individual data point

RELATIVE STANDARD DEVIATION (RSD)

$$RSD = \frac{S}{\overline{X}} * 100$$

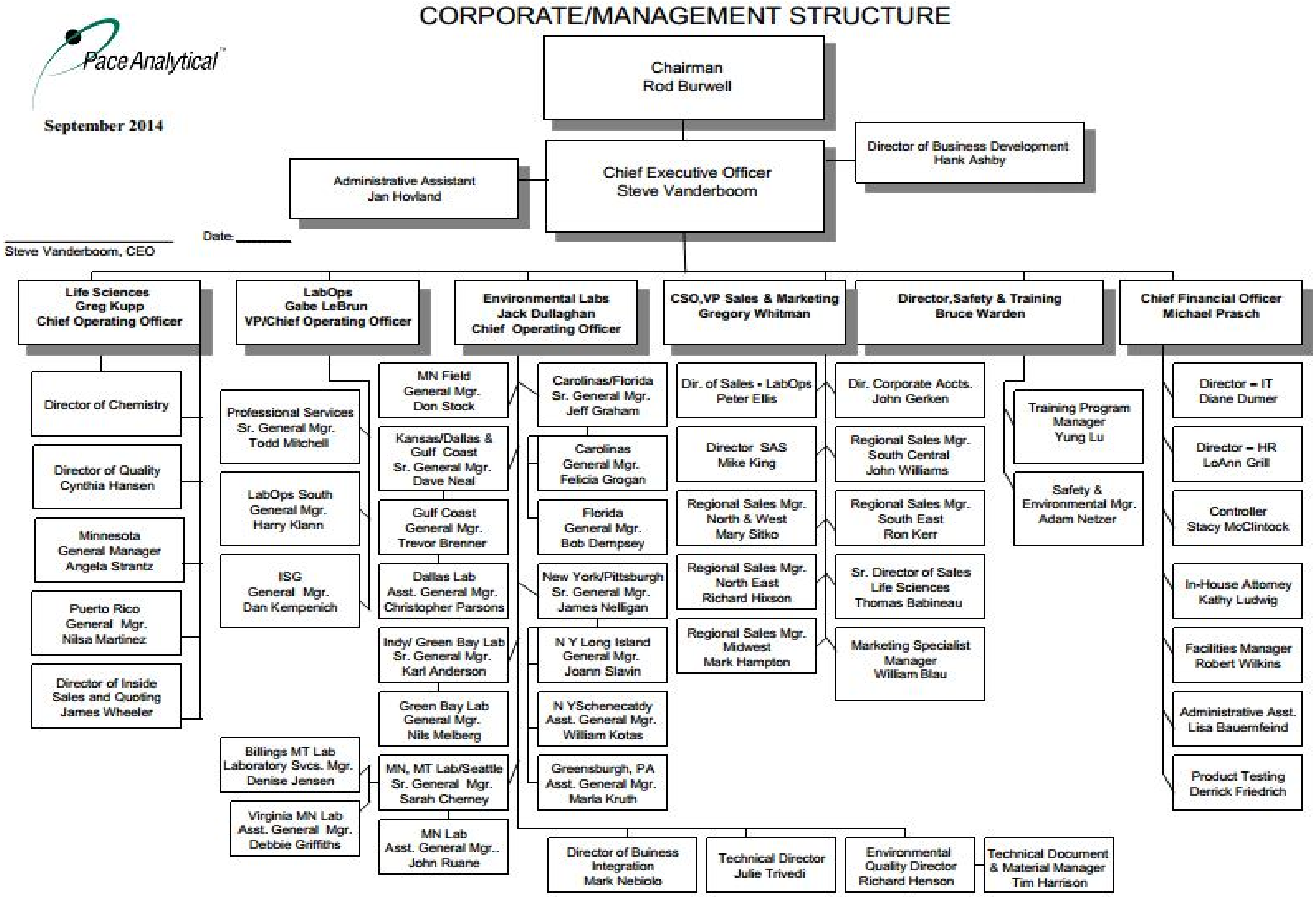
where:
S = Standard Deviation of the data points
$\overline{X}$ = average of all data points

ATTACHMENT IIA- LABORATORY ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)



*TNI TECHNICAL DIRECTOR

ATTACHMENT IIB- CORPORATE ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)

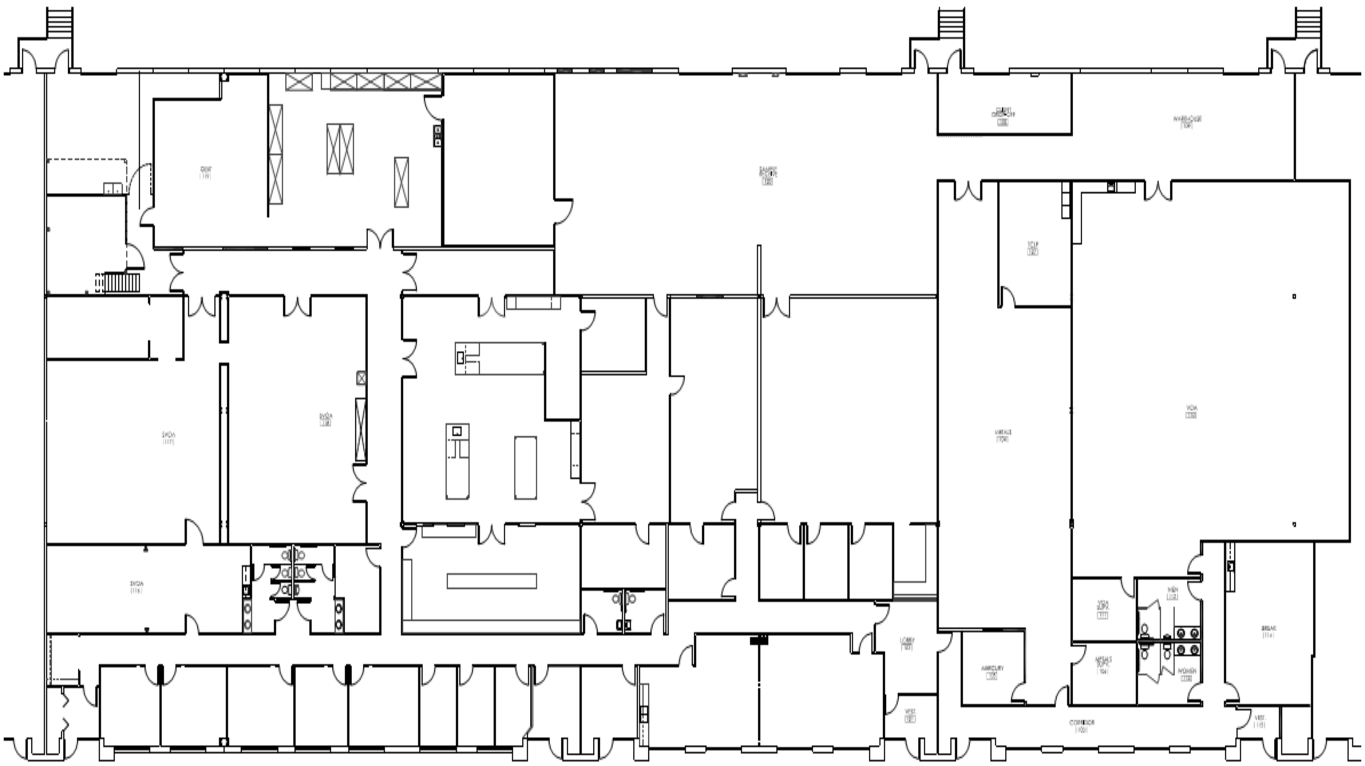


ATTACHMENT III- EQUIPMENT LIST (CURRENT AS OF ISSUE DATE)

Pace Indianapolis Equipment/Instrumentation List

INSTRUMENT	MANUFACTURER	MODEL NUMBER	DETECTOR	AUTOSAMPLER	SERVICE ANALYSIS	YEAR
GC/MS	Agilent	6890	MS 5973	8100/PT2	8260/624 VOC	2003
GC/MS	Agilent	6890	MS 5973	Centurion/PT2	8260/624/524.2 VOC	2007
GC/MS	Agilent	6890	MS 5973	8100/PT2	8260/624 VOC	2003
GC/MS	Agilent	6850N	MS 5975	Centurion/PT2	8260/624/524.2 VOC	2007
GC/MS	Agilent	6890	MS 5973	8100/PT2	8260/624 VOC	2004
GC/MS	Agilent	6850N	MS 5975	Centurion WS	8260/624 VOC	2010
GC/MS (3)	Agilent	6890	MS 5973	OI	8260/624/524.2 VOC	2007
GC/MS	Agilent	6890	MS 5973	Archon	8260	2008
GC/MS	Agilent	6890	MS 5975	OI	8260/624/524.2 VOC	2007
GC/MS	Hewlett-Packard	6890	MS 5973	7683	8270 PAH SIM	2000
GC/MS (2)	Agilent	7890	MS 5975	7683	8270 BNA	2008
GC/MS	Agilent	6890N	MS 5975	7683	8270 PAH SIM	2009
GC/MS	Agilent	6890	MS 5973	7683	625 BNA	2013
GC/MS (3)	Agilent	6890	MS 5973	7683	8270/625	2008
GC/MS	Agilent	6890	MS 5973	7683	Solvent Scan	2007
Gas Chromatograph (2)	Hewlett-Packard	5890	FID	HP 7673	8015 Alcohols /Glycols	1999
Gas Chromatograph	Agilent	6890	FID	7683	8015 Alcohols /Glycols	2006
Gas Chromatograph (2)	Agilent	7890	FID	7693	8015 ERO/DRO	2009
Gas Chromatograph (3)	Agilent	7890	Dual ECD	7693	8082/608 PCBs/8011 EDB/DBC	2009/2013
Gas Chromatograph	Agilent	6890	PID/FID	Centurion	8021/602 MBTEX	2008
Gas Chromatograph	Hewlett-Packard	5890	PID/FID	8100	8015 GRO	2011
Gas Chromatograph	Hewlett-Packard	5890	FID	EST LGX50	RSK175 Dissolved gases	2006
Gas Chromatograph	Hewlett-Packard	5890	PID	Centurion WS	8021/602 MBTEX	2008
Gas Chromatograph	Agilent	6890N	FID	8100	8015 GRO	2008
Gas Chromatograph	Agilent	6890	NPD	7683	Pesticides	2008
Gas Chromatograph (3)	Agilent	6890	Dual ECD	7683	Pesticides/PCBs/Herbicides	2008
Gas Chromatograph (2)	Agilent	5890	Dual ECD	7683	Pesticides/PCBs/Herbicides	2004
Microwave Extractors (2)	CEM	230/60	n/a	n/a	soil extraction	2008/2011
Spe-Dex	Horizon	4790	n/a	n/a	1664A Oil & Grease	2008
Trace ICP (2)	Thermo Scientific	ICAP 6500	n/a	n/a	6010/200.7 Metals	2008/2011
ICP/MS (2)	Agilent	7700	n/a	n/a	6010/200.7 Metals	2012/2014
Mercury Analyzers (2)	CETAC	M-7500	n/a	n/a	7470/7471/245 Mercury	2012
Low-Level Mercury Analyzer	Leeman Labs	Hydro AF Gold	n/a	n/a	Low-Level Mercury	2002
Auto Analyzer (2)	Lachat	Quick Chem	n/a	n/a	CN,NO3,Cl,Phenol, NH3,TKN	2010/2012
Titrosampler	Metrohm	855	n/a	n/a	Alkalinity, Acidity, pH	2007
Automated Flash Point	Tanaka	APM-8	n/a	n/a	flash point	2010
Spectrophotometer	Spec 20	Labtronics	n/a	n/a	COD, Sulfide	2002
Spectrophotometer	Hach	DR5000	n/a	n/a	Sulfate,Cr6+,Fe2+, PO4	2007
UV/Vis	Thermo	AquaMatePlus	n/a	n/a	Surfactants, Cr6+	2005
pH/ISE Meter (2)	Accumet	AR25/XL25	n/a	n/a	pH, Fluoride, Redox	2003/2010
pH/ISE Meter	Thermo Orion Star	A214	n/a	n/a	pH, Fluoride, Redox	2013
Dissolved Oxygen/pH Meter	Hach	HQ440d	n/a	n/a	BOD, cBOD	2014
BOD Analyzer	Thermo	AutoEz	n/a	n/a	BOD, cBOD	2013
TOC Analyzer	Teledyne	Phoenix 8000	n/a	n/a	TOC	2005
Discrete Analyzer	Smart Chem	200	n/a	n/a	Cyanide, Phos., Alkalinity	2006
Ion Chromatogram	Dionex	IC3000	n/a	n/a	Cl-, F-, SO4-, Br-, NO3/NO2	2008

ATTACHMENT IV- LABORATORY FLOOR PLAN (CURRENT AS OF ISSUE DATE)



ATTACHMENT V- LABORATORY CERTIFICATION LIST (CURRENT AS OF ISSUE DATE)

Pace Analytical – Indianapolis Certifications

Accrediting Authority	Program Category	Accrediting Agency	Certification #	Expiration Date
Illinois	Hazardous Waste	IL-EPA	200074	10/12/2015
Illinois	Non-Potable Water	IL-EPA	200074	10/12/2015
Indiana	Drinking Water	ISDH	C-49-06	04/17/2017
Kansas (TNI)	Hazardous Waste	KDHE	E-10177/E-10247	04/30/2015
Kansas (TNI)	Non-Potable Water	KDHE	E-10177/E-10247	04/30/2015
Kentucky	UST	KDEP	42	06/30/2015
Louisiana	Non-Potable Water	LA-DEQ	04076	06/30/2015
Louisiana	Solid Chemical Mat.	LA-DEQ	04076	06/30/2015
Ohio VAP	Hazardous Waste	OH-EPA	CL-0065	04/15/2016
Ohio VAP	Non-Potable Water	OH-EPA	CL-0065	04/15/2016
Oklahoma	Non-Potable Water	OK DEQ	2014-097	08/31/2015
Oklahoma	Solids	OK DEQ	2014-097	08/31/2015
Pennsylvania	Non-Potable Water	PA DEP	68-05340	06/30/2015
Pennsylvania	Solid Chemical Mat.	PA DEP	68-05340	06/30/2015
Texas	Non-Potable Water	TX CEQ	T104704355-14-7	01/31/2015
Texas	Solid Chemical Mat.	TX CEQ	T104704355-14-7	01/31/2015
West Virginia	Hazardous Waste	WV-DEP	330	10/31/2015
West Virginia	Non-Potable Water	WV-DEP	330	10/31/2015
Wisconsin	Non-Potable Water	WI DNR	999788130	08/31/2015
Wisconsin	Waste, Soil, Tissue	WI DNR	999788130	08/31/2015
USDA	Foreign Soil	USDA	P330-10-00128	05/04/2016

ATTACHMENT VI- PACE CHAIN-OF-CUSTODY (CURRENT AS OF ISSUE DATE)

Pace Analytical™
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A **Required** Client Information:	Section B **Required** Project Information:	Section C Invoice Information:
Company:	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ iROUND WATER D☐ KING WATER

☐ UST ☐ RA OTH☐ ______

Site Location STATE: ______

Requested Analysis Filtered (Y/N)

Section D **Required** Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes	MATRIX / CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: **DATE Signed (MM/DD/YY):**

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ATTACHMENT VII- METHOD HOLD TIME, CONTAINER AND PRESERVATION GUIDE (CURRENT AS OF ISSUE DATE)

THE HOLDING TIME INDICATED IN THE CHART BELOW IS THE MAXIMUM ALLOWABLE TIME FROM COLLECTION TO EXTRACTION AND/OR ANALYSIS PER THE ANALYTICAL METHOD. FOR METHODS THAT REQUIRE PROCESSING PRIOR TO ANALYSIS, THE HOLDING TIME IS DESIGNATED AS 'PREPARATION HOLDING TIME/ANALYSIS HOLDING TIME'.

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Acidity	SM2310B	Water	Plastic/Glass	$\leq 6^oC$	14 Days
Actinides	HASL-300	Water		pH<2 HNO_3	180 Days
Actinides	HASL-300	Solid		None	180 Days
Alkalinity	SM2320B/310.2	Water	Plastic/Glass	$\leq 6^oC$	14 Days
Alkylated PAHs		Water		$\leq 6^oC$; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved
Alkylated PAHs		Solid		$\leq 10^oC$	1 Year/40 Days
Total Alpha Radium (see note 3)	9315/903.0	Water	Plastic/Glass	pH<2 HNO_3	180 days
Total Alpha Radium (see note 3)	9315	Solid		None	180 days
Anions (Br, Cl, F, NO_2, NO_3, o-Phos, SO_4, bromate, chlorite, chlorate)	300.0/300.1/SM4110B	Water	Plastic/Glass	$\leq 6^oC$; EDA if bromate or chlorite run	All analytes 28 days except: NO_2, NO_3, o-Phos (48 Hours); chlorite (immediately for 300.0; 14 Days for 300.1). NO_2/NO_3 combo 28 days.
Anions (Br, Cl, F, NO_2, NO_3, o-Phos, SO_4, bromate, chlorite, chlorate)	300.0	Solid	Plastic/Glass	$\leq 6^oC$	All analytes 28 days except: NO_2, NO_3, o-Phos (48 hours); chlorite (immediately). NO_2/NO_3 combo 28 days.
Anions (Br, Cl, F, NO_2, NO_3, o-Phos, SO_4	9056	Water/ Solid	Plastic/Glass	$\leq 6^oC$	28 days
Aromatic and Halogenated Volatiles (see note 1)	8021	Solid	5035 vial kit	See note 1	14 days
Aromatic and Halogenated Volatiles	602/8021	Water	40mL vials	pH<2 HCl; $\leq 6^oC$; $Na_2S_2O_3$ if Cl present	14 Days (7 Days for aromatics if unpreserved)
Acid Volatile Sulfide	Draft EPA 1629	Solid	8oz Glass	$\leq 6^oC$	14 Days
Bacteria, Total Plate Count	SM9221D	Water	Plastic/WK	$\leq 6^oC$; $Na_2S_2O_3$	24 Hours

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Base/Neutrals and Acids	8270	Solid	8oz Glass	$\leq 6^oC$	14/40 Days
Base/Neutrals and Acids	625/8270	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days
Base/Neutrals, Acids & Pesticides	525.2	Water	1L Amber Glass	pH<2 HCl; $\leq 6^oC$; Na sulfite if Cl present	14/30 Days
Biomarkers		Water	$\leq 6^oC$; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved	$\leq 6^oC$; pH<2 1:1 HCl (optional)
Biomarkers		Solid	$\leq 10^oC$	1 Year/40 Days	$\leq 10^oC$
BOD/cBOD	SM5210B	Water	Plastic/Glass	$\leq 6^oC$	48 hours
BTEX/Total Hydrocarbons	TO-3	Air	Summa Canister	None	14 Days
BTEX/Total Hydrocarbons	TO-3	Air	Tedlar Bag or equivalent	None	48 Hours
Cation/Anion Balance	SM1030E	Water	Plastic/Glass	None	None
Cation Exchange	9081	Solid	8oz Glass	None	unknown
Chloride	SM4500Cl-C,E	Water	Plastic/Glass	None	28 Days
Chlorine, Residual	SM4500Cl-D,E,G/330.5/Hach 8167	Water	Plastic/Glass	None	15 minutes
Chlorophyll	SM10200H	Water	Opaque bottle or aluminum foil		
COD	SM5220C, D/410.4/Hach 8000	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days
Coliform, Fecal	SM9222D	Water	100mL Plastic	$\leq 6^oC$	6 Hours
Coliform, Fecal	SM9222D	Solid	100mL Plastic	$\leq 6^oC$	6 Hours
Coliform, Total and Escherichla (E. coli)	SM9223B	Water	100mL Plastic	$\leq 10^oC$	48 Hours after collection; results from samples analyzed 30-48 Hours after collection must be qualified as analyzed >30 hours
Color	SM2120B,E	Water	Covered Plastic/Acid Washed Amber Glass	$\leq 6^oC$	24 Hours
Condensable Particulate	EPA 202	Air	Solutions	None	180 Days

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Emissions					
Cyanide, Reactive	SW846 chap.7	Water	Plastic/Glass	None	28 Days
Cyanide, Reactive	SW846 chap.7	Solid	Plastic/Glass	None	28 Days
Cyanide, Total and Amenable	SM4500CN-A,B,C,D,E,G,I,N/9010/9012/335.4	Water	Plastic/Glass	pH≥12 NaOH; ≤ 6°C; ascorbic acid if Cl present	14 Days (24 Hours if sulfide present- applies to SM4500CN only)
Diesel Range Organics- Alaska DRO	AK102	Solid	8oz Glass	≤ 6°C	14/40 Days
Diesel Range Organics- Alaska DRO	AK102	Water	1L Glass	pH<2 HCl; ≤ 6°C	14/40 Days
Diesel Range Organics- TPH DRO	8015	Solid	8oz Glass Jar	≤ 6°C	14/40 Days
Diesel Range Organics- TPH DRO	8015	Water	1L Amber Glass	≤ 6°C; $Na_2S_2O_3$ if Cl present	7/40 Days
Diesel Range Organics- TPH DRO	8015	Tissue	1L Amber Glass	≤ - 10°C	1 Year if frozen/40 Days
Diesel Range Organics- NwTPH-Dx	Nw-TPH-Dx	Solid	8oz Glass Jar	≤ 6°C	14/40 Days
Diesel Range Organics- NwTPH-Dx	Nw-TPH-Dx	Water	1L Amber Glass	pH <2 HCl; ≤ 6°C	14/40 Days; 7 Days from collection to extraction if unpreserved
Diesel Range Organics- Wisconsin DRO	WI MOD DRO	Solid	Tared 4oz Glass Jar	≤ 6°C	10/47 Days
Diesel Range Organics- Wisconsin DRO	WI MOD DRO	Water	1L Amber Glass	≤ 6°C	14/40 Days
Dioxins and Furans	1613B	Solid	8oz Glass	≤ 6°C	1 year
Dioxins and Furans	1613B	Water	1L Amber Glass	≤ 6°C; $Na_2S_2O_3$ if Cl present	1 year
Dioxins and Furans	1613B	Fish/ Tissue	Aluminum foil	≤ 6°C	1 year
Dioxins and Furans	8290	Water	1L Amber Glass	≤ 6°C; $Na_2S_2O_3$ if Cl present	30/45 Days
Dioxins and Furans	8290	Solid	8oz Glass	≤ 6°C	30/45 Days
Dioxins and Furans	8290	Fish/ Tissue	Not specified	< -10°C	30/45 Days
Dioxins and Furans	TO-9	Air	PUF	None	30/45 Days
EDB/DBCP (8011) EDB/DBCP/1,2,3-TCP (504.1)	504.1/8011	Water	40mL vials	≤ 6°C; $Na_2S_2O_3$ if Cl present	14 Days

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Explosives	8330/8332	Water	1L Amber Glass	$\leq$ 6°C	7/40 Days
Explosives	8330/8332	Solid	8oz Glass Jar	$\leq$ 6°C	14/40 Days
Extractable Petroleum Hydrocarbons (aliphatic and aromatic)	MA-EPH	Water	1L Amber Glass	pH<2 HCl; $\leq$ 6°C	14/40 Days
Extractable Petroleum Hydrocarbons (aliphatic and aromatic)	MA-EPH	Solid	4oz Glass Jar	$\leq$ 6°C	7/40 Days
Ferrous Iron	SN3500Fe-D	Water	Glass	None	Immediate
Flashpoint/Ignitability	1010	Liquid	Plastic/Glass	None	28 Days
Fluoride	SM4500Fl-C,D	Water	Plastic	None	28 Days
Gamma Emitting Radionuclides	901.1	Water	Plastic/Glass	pH<2 HNO_3	180 days
Gasoline Range Organics	8015	Water	40mL vials	pH<2 HCl	14 Days
Gasoline Range Organics	8015	Solid	5035 vial kit	See note 1	14 days
Gasoline Range Organics-Alaska GRO	AK101	Solid	5035 vial kit	See 5035 note*	28 Days if GRO only (14 Days with BTEX)
Gasoline Range Organics-Alaska GRO	AK101	Water	40mL vials	pH<2 HCl; $\leq$ 6°C	14 Days
Gasoline Range Organics-NwTPH-Gx	Nw-TPH-Gx	Water	40mL vials	pH<2 HCl; $\leq$ 6°C	7 Days unpreserved; 14 Days preserved
Gasoline Range Organics-NwTPH-Gx	Nw-TPH-Gx	Solid	40mL vials	$\leq$ 6°C; packed jars with no headspace	14 Days
Gasoline Range Organics-Wisconsin GRO	WI MOD GRO	Water	40mL vials	pH<2 HCl; $\leq$ 6°C	14 Days
Gasoline Range Organics-Wisconsin GRO	WI MOD GRO	Solid	40mL MeOH vials	$\leq$ 6°C in MeOH	21 Days
Gross Alpha (NJ 48Hr Method)	NJAC 7:18-6	Water	Plastic/Glass	pH<2 HNO_3	48 Hrs
Gross Alpha and Gross Beta	9310/900.0	Water	Plastic/Glass	pH<2 HNO_3	180 Days
Gross Alpha and Gross Beta	9310	Solid	Glass	None	180 Days
Haloacetic Acids	552.1/552.2	Water	40mL Amber vials	NH_4Cl; $\leq$ 6°C	14/7 Days if extracts stored $\leq$ 6°C or 14/14 Days if extracts stored at $\leq$ -10°C
Hardness, Total ($CaCO_3$)	SM2340B,C/130.1	Water	Plastic/Glass	pH<2 HNO_3	6 Months
Heterotrophic Plate Count (MPC)	SM9215B	Water	100mL Plastic	$\leq$ 6°C	24 Hours
Herbicides, Chlorinated	8151	Solid	8oz Glass Jar	$\leq$ 6°C	14/40 Days
Herbicides, Chlorinated	8151	Water	1L Amber Glass	$\leq$ 6°C; $Na_2S_2O_3$ if Cl present	7/40 Days

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Herbicides, Chlorinated	515.1/515.3	Water	1L Amber Glass	$\leq$ 6°C; $Na_2S_2O_3$ if Cl present	14/28 Days
Hexavalent Chromium	7196/218.6/SM3500Cr-B,C	Water	Plastic/Glass	$\leq$ 6°C; pH 9.3-9.7 ammonium sulfate buffer	24 Hours if unpreserved, 28 Days if preserved
Hexavalent Chromium	7196 (with 3060A)	Solid		$\leq$ 6°C	24 Hours after extraction
Hydrogen Halide and Halogen Emissions	EPA 26	Air	Solutions	None	6 Months
Ignitability of Solids	1030	Non-liquid Waste	Plastic/Glass	None	28 Days
Lead Emissions	EPA 12	Air	Filter/Solutions	None	6 Months
Lipids	Pace Lipids	Tissue	Plastic/Glass	$\leq$ -10°C	1 Year if frozen
Mercury, Low-Level	1631E	Solid			
Mercury, Low-Level	1631E	Water	Fluoropolymer bottles (Glass if Hg is only analyte being tested)	12N HCl or BrCl	48 Hours for preservation or analysis; 28 Days to preservation if sample oxidized in bottle; 90 Days for analysis if preserved
Mercury, Low-Level	1631E	Tissue	Plastic/Glass	$\leq$ - 10°C	28 Days if frozen
Mercury	7471	Solid	8oz Glass Jar	$\leq$ 6°C	28 days
Mercury	7470/245.1/245.2	Water	Plastic/Glass	pH<2 HNO_3	28 Days
Mercury	7471/245.6	Tissue	Plastic/Glass	$\leq$ - 10°C	28 Days if frozen
Metals (GFAA)	7000/200.9	Water	Plastic/Glass	pH<2 HNO_3	180 Days
Metals (ICP)	NIOSH 7300A/7303	Air	Filters	None	180 Days
Metals (ICP/ICPMS)	6010/6020	Solid	8oz Glass Jar	None	180 Days
Metals (ICP/ICPMS)	6010/6020/200.7/200.8	Water	Plastic/Glass	pH<2 HNO_3	180 Days
Metals (ICP/ICPMS)	6020	Tissue	Plastic/Glass	$\leq$ -10°C	180 Days if frozen
Methane, Ethane, Ethene	8015 modified	Water	40mL vials	HCl	14 Days
Methane, Ethane, Ethene	RSK-175	Water	40mL vials	HCl	14 Days
Methane, Ethane, Ethene	EPA 3C	Air	Summa Canister	None	14 Days
Methane, Ethane, Ethene	EPA 3C	Air	Tedlar Bag or equivalent	None	48 Hours
Methanol, Ethanol	8015 modified	Water	40mL vials	$\leq$ 6°C	14 Days
Methanol, Ethanol	8015 modified	Solid	2oz Glass	$\leq$ 6°C	14 Days
Nitrogen, Ammonia	SM4500NH3/350.1	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days
Nitrogen, Kjeldahl (TKN)	351.2	Solid	Plastic/Glass	$\leq$ 6°C	28 Days

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
Nitrogen, Kjeldahl (TKN)	SM4500-Norg/351.2	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days
Nitrogen, Nitrate	SM4500-NO3/352.1	Water	Plastic/Glass	$\leq$ 6°C	24 Hours preferred
Nitrogen, Nitrate & Nitrite combination	353.2	Solid	Plastic/Glass	$\leq$ 6°C	28 Days
Nitrogen, Nitrate & Nitrite combination	SM4500-NO3/353.2	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days
Nitrogen, Nitrite or Nitrate separately	SM4500-NO2/353.2	Water	Plastic/Glass	$\leq$ 6°C	48 Hours
Nitrogen, Organic	SM4500-Norg/351.2	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days
Non-Methane Organics	EPA 25C	Air	Summa Canister	None	14 Days
Non-Methane Organics	EPA 25C	Air	Tedlar Bag or equivalent	None	48 Hours
Odor	SM2150B	Water	Glass	$\leq$ 6°C	24 Hours
Oil and Grease/HEM	1664A/SM5520B/9070	Water	Glass	pH<2 H_2SO_4 or HCl; $\leq$ 6°C	28 Days
Oil and Grease/HEM	9071	Solid	Glass	$\leq$ 6°C	28 Days
PBDEs	1614	Water	1L Amber Glass	$\leq$ 6°C	1 Year/1 Year
PBDEs	1614	Solid	Wide Mouth Jar	$\leq$ 6°C	1 Year/1 Year
PBDEs	1614	Tissue	Aluminum Foil	$\leq$ -10°C	1 Year/1 Year
PCBs and Pesticides, Organochlorine (OC)	TO-4/TO-10	Air	PUF	None	7/40 Days
PCBs and Pesticides, Organochlorine (OC)	608	Water	1L Amber Glass		Pest: 7/40 Days; PCB: 1 Year/1 Year
Pesticides, Organochlorine (OC)	8081	Water	1L Amber Glass	$\leq$ 6°C; $Na_2S_2O_3$ if Cl present	7/40 Days
Pesticides, Organochlorine (OC)	8081	Solid	8oz Glass Jar	$\leq$ 6°C	14/40 Days
Pesticides, Organochlorine (OC)	8081	Tissue	8oz Glass Jar	$\leq$ -10°C	1 Year if frozen/40 Days
Pesticides, Organophosphorous (OP)	8141	Solid	8oz Glass Jar	$\leq$ 6°C	14/40 Days
Pesticides, Organophosphorous (OP)	8141	Water	1L Amber Glass	pH 5-8 with NaOH or H_2SO_4; $\leq$ 6°C; $Na_2S_2O_3$ if Cl present	7/40 Days
PCBs (Aroclors)	8082	Water	1L Amber Glass	$\leq$ 6°C; $Na_2S_2O_3$ if Cl	1 Year/1 Year

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
				present	
PCBs (Aroclors)	8082	Solid	8oz Glass Jar	$\leq$ 6°C	1 Year/1 Year
PCBs (Aroclors)	8082	Tissue	Plastic/Glass	$\leq$ -10°C	1 Year if frozen/1 Year
PCB Congeners	1668A	Water	1L Amber Glass	$\leq$ 6°C but above freezing	1 Year/1 Year
PCB Congeners	1668A	Solid	4-8oz Glass Jar	$\leq$ 6°C but above freezing	1 Year/1 Year
PCB Congeners	1668A	Tissue	4-8oz Glass Jar	$\leq$ -10°C	1 Year/1 Year
Oil Range Organics- ORO					
Oxygen, Dissolved (Probe)	SM4500-O	Water	Glass	None	15 minutes
Paint Filter Liquid Test	9095	Water	Plastic/Glass	None	N/A
Particulates	PM-10	Air	Filters	None	180 Days
Permanent Gases	EPA 3C	Air	Summa Canister	None	14 Days
Permanent Gases	EPA 3C	Air	Tedlar Bag or equivalent	None	48 Hours
pH	SM4500H+B/9040	Water	Plastic/Glass	None	15 minutes
pH	9045	Solid	Plastic/Glass	None	
Phenol, Total	420.1/420.4/9065/9066	Water	Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days
Phosphorus, Orthophosphate	SM4500P/365.1/365.3	Water	Plastic	Filter; $\leq$ 6°C	Filter within 15 minutes, Analyze within 48 Hours
Phosphorus, Total	SM4500P/ 365.1/365.3/365.4	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days
Phosphorus, Total	365.4	Solid	Plastic/Glass	$\leq$ 6°C	28 Days
Polynuclear Aromatic Hydrocarbons (PAH)	TO-13	Air	PUF	None	7/40 Days
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Solid	8oz Glass Jar	$\leq$ 6°C	14/40 Days
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Water	1L Amber Glass	$\leq$ 6°C; $Na_2S_2O_3$ if Cl present	7/40 Days
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Tissue	Plastic/Glass	$\leq$ -10°C	1 Year if frozen/40 Days
Radioactive Strontium	905.0	Water	Plastic/Glass	pH<2 HNO_3	180 days
Radium-226	903.0/903.1	Water	Plastic/Glass	pH<2 HNO_3	180 days
Radium-228 (see note 3)	9320/904.0	Water	Plastic/Glass	pH<2 HNO_3	180 days
Radium-228 (see note 3)	9320	Solid			
Residual Range Organics- Alaska RRO	AK103	Solid	8oz Glass	$\leq$ 6°C	14/40 Days
Saturated Hydrocarbons		Water	$\leq$ 6°C; pH<2	14/40 Days	$\leq$ 6°C; pH<2 1:1

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
			1:1 HCl (optional)	preserved; 7/40 Days unpreserved	HCl (optional)
Saturated Hydrocarbons		Solid	≤ 10°C	1 Year/40 Days	≤ 10°C
Silica, Dissolved	SM4500Si-D	Water	Plastic	≤ 6°C	28 Days
Solids, Settleable	SM2540F	Water	Glass	≤ 6°C	48 Hours
Solids, Total	SM2540B	Water	Plastic/Glass	≤ 6°C	7 Days
Solids, Total	SM2540G	Solid	Plastic/Glass	≤ 6°C	7 Days
Solids, Total (FOC, OM, Ash)	ASTM D2974	Solid	Plastic/Glass	≤ 6°C	7 Days
Solids, Total Dissolved	SM2540C	Water	Plastic/Glass	≤ 6°C	7 Days
Solids, Total Suspended	SM2540D/USGS I-3765-85	Water	Plastic/Glass	≤ 6°C	7 Days
Solids, Total Volatile	160.4/SM2540E	Water	Plastic/Glass	≤ 6°C	7 Days
Solids, Total Volatile	160.4	Solid	Plastic/Glass	≤ 6°C	7 Days
Specific Conductance	SM2510B/9050/120.1	Water	Plastic/Glass	≤ 6°C	28 Days
Stationary Source Dioxins and Furans	EPA 23	Air	XAD Trap	None	30/45 Days
Stationary Source Mercury	EPA 101	Air	Filters	None	180 Days, 28 Days for Hg
Stationary Source Metals	EPA 29	Air	Filters	None	180 Days, 28 Days for Hg
Stationary Source PM10	EPA 201A	Air	Filters	None	180 Days
Stationary Source Particulates	EPA 5	Air	Filter/Solutions	None	180 Days
Sulfate	SM4500SO4/9036/ 9038/375.2/ASTM D516	Water	Plastic/Glass	≤ 6°C	28 Days
Sulfide, Reactive	SW-846 Chap.7	Water	Plastic/Glass	None	28 Days
Sulfide, Reactive	SW-846 Chap.7	Solid	Plastic/Glass	None	28 Days
Sulfide, Total	SM4500S/9030	Water	Plastic/Glass	pH>9 NaOH; ZnOAc; ≤ 6°C	7 Days
Sulfite	SM4500SO3	Water	Plastic/Glass	None	15 minutes
Surfactants (MBAS)	SM5540C	Water	Plastic/Glass	≤ 6°C	48 Hours
Total Organic Carbon (TOC)	SM5310B,C,D/9060	Water	Glass	pH<2 H_2SO_4 or HCl; ≤ 6°C	28 Days
Total Organic Carbon (TOC)	9060/Walkley Black	Solid	Glass	≤ 6°C	14 Days
Total Organic Halogen (TOX)	SM5320/9020/9021	Water	Glass; no headspace	≤ 6°C	14 Days
Tritium	906.0	Water	Glass	None	180 days
Turbidity	SM2130B/180.1	Water	Plastic/Glass	≤ 6°C	48 Hours
Total Uranium	908.0/ASTM D5174-97	Water	Plastic/Glass	pH<2 HCl	180 days
Volatile Petroleum Hydrocarbons (aliphatic and	MA-VPH	Water	40mL vials	pH<2 HCl; ≤ 6°C	14 Days preserved

Parameter	Method	Matrix	Container	Preservative	Max Hold Time
aromatic)					
Volatile Petroleum Hydrocarbons (aliphatic and aromatic)	MA-VPH	Solid	4-8oz Glass Jar	$\leq 6^{o}C$; packed jars with no headspace	7/28 Days
Volatiles	TO-14	Air	Summa Canister	None	30 Days
Volatiles	TO-14	Air	Tedlar Bag or equivalent	None	48 Hours
Volatiles	TO-15	Air	Summa Canister	None	30 Days
Volatiles	8260	Solid	5035 vial kit	See note 1	14 days
Volatiles	8260	Water	40mL vials	pH<2 HCl; $\leq 6^{o}C$; $Na_2S_2O_3$ if Cl present	14 Days
Volatiles	8260	Conc. Waste	5035 vial kit or 40mL vials	$\leq 6^{o}C$	14 Days
Volatiles	624	Water	40mL vials	pH<2 HCl; $\leq 6^{o}C$; $Na_2S_2O_3$ if Cl present	14 Days (7 Days for aromatics if unpreserved)
Volatiles (see note 2)	524.2	Water	40mL vials (in duplicate)	pH<2 HCl; $\leq 6^{o}C$; Ascorbic acid or $Na_2S_2O_3$ if Cl present[2]	14 Days

[1] **5035/5035A Note**: 5035 vial kit typically contains 2 vials water, preserved by freezing **or**, 2 vials aqueous sodium bisulfate preserved at $4^{o}C$, **and** one vial methanol preserved at $\leq 6^{o}C$ **and** one container of unpreserved sample stored at $\leq 6^{o}C$.

[2] Method 524.2 lists ascorbic acid as the preservative when residual chlorine is suspected, unless gases or Table 7 compounds are NOT compounds of interest and then sodium thiosulfate is the preservative recommended.

[3] Methods 9315 and 9320 both state that if samples are unpreserved, the samples should be brought to the lab within 5 days of collection, preserved in the lab, and then allowed to sit for a minimum of 16 hours before sample preparation/analysis.

ATTACHMENT 4

Pace Analytical Services, Inc. Quality Assurance Manual – Minneapolis, Minnesota Laboratory

QUALITY ASSURANCE MANUAL

Quality Assurance/Quality Control Policies and Procedures

Pace Analytical Services – Minneapolis
1700 Elm Street SE, Suite 200, Minneapolis, MN 55414
612-607-1700

Pace Analytical Services, Inc. – Montana
150 North 9th Street, Billings, Montana 59101
406-254-7226

Pace Analytical Services, Inc. – Virginia and Duluth
315 Chestnut Street, Virginia, MN 55792
206 2nd Avenue West, Virginia, MN 55792
1510 W Superior Street, Duluth, 55806
218-735-6700

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Table of Contents

1.0. INTRODUCTION AND ORGANIZATIONAL STRUCTURE

"Working together to protect our environment and improve our health"
Pace Analytical Services Inc. - Mission Statement

1.1. Introduction to PASI

1.1.1. Pace Analytical Services, Inc. (PASI) is a privately held, full-service analytical testing firm operating a nationwide system of laboratories. PASI offers extensive services beyond standard analytical testing, including: bioassay for aquatic toxicity, air toxics, dioxins and coplanar PCB's by high resolution mass spectroscopy , radiochemical analyses, product testing, pharmaceutical testing, field services and mobile laboratory capabilities. PASI has implemented a consistent Quality System in each of its laboratories and service centers. In addition, the company utilizes an advanced data management system that is highly efficient and allows for flexible data reporting. Together, these systems ensure data reliability and superior on-time performance. This document defines the Quality System and QA/QC protocols.

1.1.2. Our goal is to combine our expertise in laboratory operations with customized solutions to meet the specific needs of our customers.

1.2. Statement of Purpose

1.2.1. To meet the business needs of our customers for high quality, cost-effective analytical measurements and services.

1.3. Quality Policy Statement and Goals of the Quality System

1.3.1. PASI management is committed to maintaining the highest possible standard of service for our customers by following a documented quality system that is fully compliant with the applicable NELAC or TNI standards. The overall objective of this quality system is to provide reliable data of known quality through adherence to rigorous quality assurance policies and quality control procedures as documented in this Quality Assurance Manual.

1.3.2. All personnel within the PASI network are required to be familiar with all facets of the quality system relevant to their position and implement these policies and procedures in their daily work. This daily focus on quality is applied with initial project planning, continued through all field and laboratory activities, and is ultimately included in the final report generation.

1.3.3. PASI management demonstrates its commitment to quality by providing the resources, including facilities, equipment, and personnel to ensure the adherence to these documented policies and procedures and to promote the continuous improvement of the quality system. All PASI personnel must comply with all current applicable state, federal, and industry standards (2003 NELAC Standard, 2009 TNI Standard, etc.), and are required to perform all tests in accordance with stated methods and customer requirements.

1.4. Core Values

1.4.1. **Integrity-** Pace personnel are required to abide by the PASI Code of Ethics and all Pace employees must go through Data Integrity/Ethics training upon initial orientation and as an annual refresher.

1.4.2. **Value Employees-** Pace management views employees as our most important asset and communicates to them the relevance and importance of their activities within their job functions and how they contribute to the achievement of the objectives of the quality management system.

1.4.3. **Know Our Customers-** Pace makes every effort to know our customers and address their sampling and analytical needs. More information on this item can be found in section 2.0.

1.4.4. **Honor Commitments-** Pace labs focus on making solid commitments with regards to quality, capacity, and agreed upon turnaround time to our customers.

1.4.5. **Flexible Response To Demand-** Pace labs are equipped with both the material and personnel resources to enable them to be responsive to the demands of customers when situations or projects need change.

1.4.6. **Pursue Opportunities-** Pace is committed to pursuing opportunities for the growth of the company by constantly exploring markets and areas where we can expand.

1.4.7. **Continuously Improve-** Pace has committed much time and effort into establishing a continuous improvement program where company personnel meet on a regular basis to share ideas in cost reduction, production improvement and standardization in order to develop best practices. This information, as well as company financial and production metrics, are tracked, evaluated, and shared with each Pace facility.

1.5. Code of Ethics

1.5.1. PASI's fundamental ethical principles are as follows:

1.5.1.1. Each PASI employee is responsible for the propriety and consequences of his or her actions;

1.5.1.2. Each PASI employee must conduct all aspects of Company business in an ethical and strictly legal manner, and must obey the laws of the United States and of all localities, states and nations where PASI does business or seeks to do business;

1.5.1.3. Each PASI employee must reflect the highest standards of honesty, integrity and fairness on behalf of the Company with customers, suppliers, the public, and one another.

1.5.1.4. Each PASI employee must recognize and understand that our daily activities in environmental laboratories affect public health as well as the environment and that environmental laboratory analysts are a critical part of the system society depends upon to improve and guard our natural resources:

1.5.2. Strict adherence by each PASI employee to this Code of Ethics and to the Standards of Conduct is essential to the continued vitality of PASI and to continue the pursuit of our common mission to protect our environment and improve our health.

1.5.3. Failure to comply with the Code of Ethics and Standards of Conduct will result in disciplinary action up to and including termination and referral for civil or criminal prosecution where appropriate. An employee will be notified of an infraction and given an opportunity to explain, as prescribed under current disciplinary procedures.

1.5.4. Any Pace employee can contact corporate management to report an ethical concern by calling the anonymous hotline at 612-607-6431.

1.6. Standards of Conduct

1.6.1. Data Integrity

1.6.1.1. The accuracy and integrity of the analytical results and its supporting documentation produced at PASI are the cornerstones of the company. Lack of data integrity is an assault on our most basic values putting PASI and its employees at grave financial and legal risk and will not be tolerated. Therefore, employees are to accurately prepare and maintain all technical records, scientific notebooks, calculations, and databases. Employees are prohibited from making false entries or misrepresentations of data for any reason.

1.6.1.2. Managerial staff must make every effort to ensure that personnel are free from any undue pressures that may affect the quality or integrity of their work including commercial, financial, over-scheduling, and working condition pressures.

1.6.2. Confidentiality

1.6.2.1. PASI employees must not use or disclose confidential or proprietary information except when in connection with their duties at PASI. This is effective over the course of employment and for an additional period of two years thereafter.

1.6.2.2. Confidential or proprietary information, belonging to either PASI and/or its customers, includes but is not limited to test results, trade secrets, research and development matters, procedures, methods, processes and standards, company-specific techniques and equipment, marketing and customer information, inventions, materials composition, etc.

1.6.3. Conflict of Interest

1.6.3.1. PASI employees must avoid situations that might involve a conflict of interest or could appear questionable to others. The employee must be careful in two general areas:

1.6.3.1.1. Participation in activities that conflict or appear to conflict with the employees' PASI responsibilities.

1.6.3.1.2. Offering or accepting anything that might influence the recipient or cause another person to believe that the recipient may be influenced to behave or in a different manner than he would normally. This includes bribes, gifts, kickbacks, or illegal payments.

1.6.3.2. Employees are not to engage in outside business or economic activity relating to a sale or purchase by the Company. Other problematic activities include service on the Board of Directors of a competing or supplier company, significant ownership in a competing or supplier company, employment for a competing or supplier company, or participation in any outside business during the employee's work hours.

1.6.4. Compliance

1.6.4.1. All employees are required to read, understand, and comply with the various components of the standards listed in this document. As confirmation that they understand their responsibility, each employee is required to sign an acknowledgment form annually that then becomes part of the employee's permanent record. Employees will be held accountable for complying with the Quality Systems as summarized in the Quality Assurance Manual.

1.7. Laboratory Organization

1.7.1. The PASI Corporate Office centralizes company-wide accounting, business development, financial management, human resources development, information systems, marketing, quality, safety, and training activities. PASI's Director of Quality is responsible for assisting the development, implementation and monitoring of quality programs for the company. See Attachment IIB for the Corporate Organizational structure.

1.7.2. Each laboratory within the system operates with local management, but all labs share common systems and receive support from the Corporate Office.

1.7.3. A Senior General Manager (SGM) oversees all laboratories and service centers in their assigned region. Each laboratory or facility in the company is then directly managed by an SGM, a General Manager (GM), an Assistant General Manager (AGM), or an Operations Manager (OM). Quality Managers (QM) or Senior Quality Managers (SQM) at each laboratory report directly to the highest level of local laboratory management, however named, that routinely makes day-to-day decisions regarding that facility's operations. The QMs and SQMs will also receive guidance and direction from the corporate Director of Quality.

1.7.4. The SGM, GM, AGM or OM, or equivalent functionality in each facility, bears the responsibility for the laboratory operations and serves as the final, local authority in all matters. In the absence of these managers, the SQM/QM serves as the next in command, unless the manager in charge has assigned another designee. He or she assumes the responsibilities of the manager, however named, until the manager is available to resume the duties of their position. In the absence of both the manager and the SQM/QM, management responsibility of the laboratory is passed to the Technical Director, provided such a position is identified, and then to the most senior department manager until the return of the lab manager or SQM/QM. The most senior department manager in charge may include the Client Services Manager or the Administrative Business Manager at the discretion of the SGM/GM/AGM/OM.

1.7.5. A Technical Director who is absent for a period of time exceeding 15 consecutive calendar days shall designate another full-time staff member meeting the qualifications of the technical director to temporarily perform this function. The laboratory SGM/GM/AGM/OM or SQM/QM has the authority to make this designation in the event the existing Technical Director is unable to do so. If this absence exceeds 35 consecutive calendar days, the primary accrediting authority shall be notified in writing.

1.7.6. The SQM/QM has the responsibility and authority to ensure the Quality System is implemented and followed at all times. In circumstances where a laboratory is not meeting the established level of quality or following the policies set forth in this Quality Assurance Manual, the SQM/QM has the authority to halt laboratory operations should he or she deem such an action necessary. The SQM/QM will immediately communicate the halting of operations to the SGM/GM/AGM/OM and keep them posted on the progress of corrective actions. In the event the SGM/GM/AGM/OM and the SQM/QM are not in agreement as to the need for the suspension, the Chief Operating Officer and Director of Quality will be called in to mediate the situation.

1.7.7. The technical staff of the laboratory is generally organized into the following functional groups:

- Organic Sample Preparation

- Wet Chemistry Analysis
- Metals Analysis
- Volatiles Analysis
- Semi-volatiles Analysis
- HRMS Analysis
- Radiochemical Analysis
- Microbiology

1.7.8. Appropriate support groups are present in each laboratory. The actual organizational structure for PASI – Minneapolis, Billing, Virginia and Duluth are listed in Attachment II. In the event of a change in SGM/GM/AGM/OM, SQM/QM, or any Technical Director, the laboratory will notify its accrediting authorities and revise the organizational chart in the Quality Assurance Manual (QAM) within 30 days. For changes in Department Managers or Supervisors or other laboratory personnel, no notifications will be sent to the laboratory's accrediting agencies; changes to the organizational chart will be updated during or prior to the annual review process. Changes or additions in these key personnel will also be noted by additional signatures on the QAM, as applicable. In any case, the QAM will remain in effect until the next scheduled revision.

1.8. Laboratory Job Descriptions

1.8.1. Senior General Manager

- Oversees all functions of all the operations within their designated region;
- Oversees the development of local GMs/AGMs/OMs within their designated region;
- Oversees and authorizes personnel development including staffing, recruiting, training, workload scheduling, employee retention and motivation;
- Oversees the preparation of budgets and staffing plans for all operations within their designated region;
- Ensures compliance with all applicable state, federal and industry standards;
- Works closely with Regional Sales Management.

1.8.2. General Manager

- Oversees all functions of their assigned operations;
- Authorizes personnel development including staffing, recruiting, training, workload scheduling, employee retention and motivation;
- Prepares budgets and staffing plans;
- Monitors the Quality Systems of the laboratory and advises the SQM/QM accordingly;
- Ensures compliance with all applicable state, federal and industry standards.

1.8.3. Assistant General Manager / Operations Manager

- In the absence of the SGM/GM, performs all duties as listed above for the SGM or GM;
- Oversees the daily production and quality activities of all departments;
- Manages all departments and works with staff to ensure department objectives are met;
- Works with all departments to ensure capacity and customer expectations are accurately understood and met;
- Works with SGM/GM to prepare appropriate budget and staffing plans for all departments;

- Responsible for prioritizing personnel and production activities within all departments;
- Performs formal and informal performance reviews of departmental staff.

1.8.4. Senior Quality Manager

- Provides quality oversight for multiple laboratories where there is not a local quality manager or for labs where there are multiple and separately distinct quality systems in the same facility;
- Responsible for implementing, maintaining and improving the quality system while functioning independently from laboratory operations. Reports directly to the highest level of local laboratory facility management, however named, that routinely makes day-to-day decisions regarding laboratory operations, but receives direction and assistance from the Corporate Director of Quality;
- Ensures that communication takes place at all levels within the lab regarding the effectiveness of the quality system and that all personnel understand their contributions to the quality system;
- Monitors Quality Assurance/Quality Control activities to ensure that the laboratory achieves established standards of quality (as set forth by the Corporate Quality office). The Quality Manager is responsible for reporting the lab's level of compliance to these standards to the Corporate Director of Quality on a quarterly basis;
- Maintains records of quality control data and evaluates data quality;
- Conducts periodic internal audits and coordinates external audits performed by regulatory agencies or customer representatives;
- Reviews and maintains records of proficiency testing results;
- Maintains the document control system;
- Assists in development and implementation of appropriate training programs;
- Provides technical support to laboratory operations regarding methodology and project QA/QC requirements;
- Maintains certifications from federal and state programs;
- Ensures compliance with all applicable state, federal and industry standards;
- Maintains the laboratory training records, including those in the Learning Management System (LMS), and evaluates the effectiveness of training;
- Monitors correctives actions;
- Maintains the currency of the Quality Manual.

1.8.5. Quality Manager

- Responsible for implementing, maintaining and improving the quality system while functioning independently from laboratory operations. Reports directly to the highest level of local laboratory facility management, however named, that routinely makes day-to-day decisions regarding laboratory operations, but receives direction and assistance from the Corporate Director of Quality. They may also report to a Senior Quality Manager within the same facility;
- Ensures that communication takes place at all levels within the lab regarding the effectiveness of the quality system and that all personnel understand their contributions to the quality system;
- Monitors Quality Assurance/Quality Control activities to ensure that the laboratory achieves established standards of quality (as set forth by the Corporate Quality office). The Quality Manager is responsible for reporting the lab's level of compliance to these standards to the Corporate Director of Quality on a quarterly basis;
- Maintains records of quality control data and evaluates data quality;

- Conducts periodic internal audits and coordinates external audits performed by regulatory agencies or customer representatives;
- Reviews and maintains records of proficiency testing results;
- Maintains the document control system;
- Assists in development and implementation of appropriate training programs;
- Provides technical support to laboratory operations regarding methodology and project QA/QC requirements;
- Maintains certifications from federal and state programs;
- Ensures compliance with all applicable state, federal and industry standards;
- Maintains the laboratory training records, including those in the Learning Management System (LMS), and evaluates the effectiveness of training;
- Monitors correctives actions;
- Maintains the currency of the Quality Manual.

1.8.6. Quality Analyst

- Assists the SQM/QM in the performance of quality department responsibilities as delegated by the SQM/QM;
- Assists in monitoring QA/QC data;
- Assists in internal audits;
- Assists in maintaining training records;
- Assists in maintaining the document control system;

1.8.7. Technical Director

- Monitors the standards of performance in quality assurance and quality control data;
- Monitors the validity of analyses performed and data generated;
- Reviews tenders, contracts and QAPPs to ensure the laboratory can meet the data quality objectives for any given project;
- Serves as the manager of the laboratory in the absence of the SGM/GM/AGM/OM and SQM/QM;
- Provides technical guidance in the review, development, and validation of new methodologies.

1.8.8. Administrative Business Manager

- Responsible for financial and administrative management for the entire facility;
- Provides input relative to tactical and strategic planning activities;
- Organizes financial information so that the facility is run as a fiscally responsible business;
- Works with staff to confirm that appropriate processes are put in place to track revenues and expenses;
- Provide ongoing financial information to the SGM/GM/AGM/OM and the management team so they can better manage their business;
- Utilizes historical information and trends to accurately forecast future financial positions;
- Works with management to ensure that key measurements are put in place to be utilized for trend analysis—this will include personnel and supply expenses, and key revenue and expense ratios;

- Works with SGM/GM/AGM/OM to develop accurate budget and track on an ongoing basis;
- Works with entire management team to submit complete and justified capital budget requests and to balance requests across departments;
- Works with project management team and administrative support staff to ensure timely and accurate invoicing.

1.8.9. Client Services Manager

- Oversees all the day to day activities of the Client Services Department which includes Project Management and, possibly, Sample Control;
- Responsible for staffing and all personnel management related issues for Client Services;
- Serves as the primary senior consultant to customers on all project related issues such as set up, initiation, execution and closure;
- Performs or is capable of performing all duties listed for that of Project Manager.

1.8.10. Project Manager

- Coordinates daily activities including taking orders, reporting data and analytical results;
- Serves as the primary technical and administrative liaison between customers and PASI;
- Communicates with operations staff to update and set project priorities;
- Provides results to customers in the requested format (verbal, hardcopy, electronic, etc.);
- Works with customers, laboratory staff, and other appropriate PASI staff to develop project statements of work or resolve problems of data quality;
- Responsible for solicitation of work requests, assisting with proposal preparation and project initiation with customers and maintain customer records;
- Mediation of project schedules and scope of work through communication with internal resources and management;
- Responsible for preparing routine and non-routine quotations, reports and technical papers;
- Interfaces between customers and management personnel to achieve customer satisfaction;
- Manages large-scale complex projects;
- Supervises less experienced project managers and provide guidance on management of complex projects;
- Arranges bottle orders and shipment of sample kits to customers;
- Verifies login information relative to project requirements and field sample Chains-of-Custody.

1.8.11. Project Coordinator

- Responsible for preparation of project specifications and provides technical/project support;
- Coordinates project needs with other department sections and assists with proposal preparation;
- Prepares routine proposals and invoicing;
- Responsible for scanning, copying, assembling and binding final reports;
- Other duties include filing, maintaining forms, process outgoing mail, maintaining training database and data entry.

1.8.12. Department Manager/Supervisor

- Oversees the day-to-day production and quality activities of their assigned department;
- Ensures that quality assurance and quality control criteria of analytical methods and projects are satisfied;
- Assesses data quality and takes corrective action when necessary;
- Approves and releases technical and data management reports;
- Ensures compliance with all applicable state, federal and industry standards.

1.8.13. Group Supervisor/Leader

- Trains analysts in laboratory operations and analytical procedures;
- Organizes and schedules analyses with consideration for sample holding times;
- Implements data verification procedures by assigning data verification duties to appropriate personnel;
- Evaluates instrument performance and supervises instrument calibration and preventive maintenance programs;
- Reports non-compliance situations to laboratory management including the SQM/QM.

1.8.14. Laboratory Analyst

- Performs detailed preparation and analysis of samples according to published methods and laboratory procedures;
- Processes and evaluates raw data obtained from preparation and analysis steps;
- Generates final results from raw data, performing primary review against method criteria;
- Monitors quality control data associated with analysis and preparation. This includes examination of raw data such as chromatograms as well as an inspection of reduced data, calibration curves, and laboratory notebooks;
- Reports data in LIMS, authorizing for release pending secondary approval;
- Conducts routine and non-routine maintenance of equipment as required;
- Performs or is capable of performing all duties associated with that of Laboratory Technician.

1.8.15. Laboratory Technician

- Prepares standards and reagents according to published methods or in house procedures;
- Performs preparation and analytical steps for basic laboratory methods;
- Works under the direction of a Laboratory Analyst on complex methodologies;
- Assists Laboratory Analysts on preparation, analytical or data reduction steps for complex methodologies;
- Monitors quality control data as required or directed. This includes examination of raw data such as chromatograms as well as an inspection of reduced data, calibration curves, and laboratory notebooks.

1.8.16. Sample Management Personnel

- Signs for incoming samples and verifies the data entered on the Chain of custody forms;
- Enters the sample information into the Laboratory Information Management System (LIMS) for tracking and reporting;

- Stages samples according to EPA requirements;
- Assists Project Managers and Coordinators in filling bottle orders and sample shipments.

1.8.17. Systems Administrator or Systems Manager

- Assists with the creation and maintenance of electronic data deliverables (EDDs);
- Coordinates the installation and use of all hardware, software and operating systems;
- Performs troubleshooting on all aforementioned systems;
- Trains new and existing users on systems and system upgrades;
- Maintains all system security passwords;
- Maintains the electronic backups of all computer systems.

1.8.18. Safety/Chemical Hygiene Officer

- Maintains the laboratory Chemical Hygiene Plan;
- Plans and implements safety policies and procedures;
- Maintains safety records;
- Organizes and/or performs safety training;
- Performs safety inspections and provides corrective/preventative actions;
- Assists personnel with safety issues.

1.8.19. Program Director/Hazardous Waste Coordinator (or otherwise named)

- Evaluates waste streams and helps to select appropriate waste transportation and disposal companies;
- Maintains complete records of waste disposal including waste manifests and state reports;
- Assists in training personnel on waste-related issues such as waste handling and storage, waste container labeling, proper satellite accumulation, secondary containment, etc.;
- Conducts a weekly inspection of the waste storage areas of the laboratory.

1.9. Training and Orientation

1.9.1. Training for Pace employees is managed through a web-based Learning Management System. After a new employee has been instructed in matters of human resources, they are given instructional materials for the LMS and a password for access.

1.9.2. A new hire training checklist is provided to the new employee that lists training items for the employee to work through either independently on LMS or with their supervisor or trainer. The training items that can be completed independently include:

- Reading through applicable Standard Operating Procedures;
- Reviewing the Quality Manual and Chemical Hygiene Plan;
- Core training modules such as quality control indicators, basic laboratory skills, etc.;
- Quality Systems training including traceability of measurements, method calibration, calibration verification, accuracy, precision and uncertainty of measurements, corrective actions, documentation, and root cause analysis;
- Data Integrity/Ethics training.

1.9.3. The new employee's Department Supervisor provides the employee with a basic understanding of the role of the laboratory within the structure of PASI and the basic elements of that individual's position. Supervised training uses the following techniques:

- Hands-on training
- Training checklists/worksheets
- Lectures and training sessions
- Method-specific training
- Conferences and seminars
- Short courses
- Specialized training by instrument manufacturers
- Proficiency testing programs.
- On-line courses

1.9.4. Group Supervisors/Leaders are responsible for providing documentation of training and proficiency for each employee under their supervision. The employee's training file indicates what procedures an analyst or a technician is capable of performing, either independently or with supervision. The files also include documentation of continuing capability, which are fully detailed in Section 3.4. Training documentation files for each person are maintained by the Quality Office either in hardcopy format or within the LMS.

1.9.5. All procedures and training records are maintained and available for review during laboratory audits. These procedures are reviewed/updated periodically by laboratory management. Additional information can be found in SOP S-ALL-Q-020 **Training and Employee Orientation** or its equivalent revision or replacement.

1.10. Data Integrity System

1.10.1. The data integrity system at PASI provides assurances to management that a highly ethical approach is being applied to all planning, training and implementation of methods. Data integrity is crucial to the success of our company and Pace Analytical is committed to creating and maintaining a culture of quality throughout the organization. To accomplish this goal, PASI has implemented a data integrity system that encompasses the following four requirements:

1.10.1.1. A data integrity training program: standardized training is given to each new employee and a yearly refresher is presented to all employees. Key topics addressed by this training include:

1.10.1.1.1. Need for honesty and transparency in analytical reporting
1.10.1.1.2. Process for reporting data integrity issues
1.10.1.1.3. Specific examples of unethical behavior and improper practices
1.10.1.1.4. Documentation of non-conforming data that is still useful to the data user
1.10.1.1.5. Consequences and punishments for unethical behavior
1.10.1.1.6. Examples of monitoring devices used by management to review data and systems

1.10.1.2. Signed data integrity documentation for all employees: this includes a written quiz following the Ethics training session and written agreement to abide by the Code of Ethics and Standards of Conduct explained in the employee manual.

1.10.1.3. In-depth, periodic monitoring of data integrity including peer data review and validation, internal raw data audits, proficiency testing studies, etc.

1.10.1.4. Documentation of any review or investigation into possible data integrity infractions. This documentation, including any disciplinary actions involved, corrective actions taken, and notifications to customers must be retained for a minimum of five years.

1.10.2. PASI management makes every effort to ensure that personnel are free from any undue pressures that affect the quality of their work including commercial, financial, over scheduling, and working condition pressures.

1.10.3. Corporate management also provides all PASI facilities a mechanism for confidential reporting of data integrity issues that ensures confidentiality and a receptive environment in which all employees are comfortable discussing items of ethical concern. The anonymous message line is monitored by the Corporate Director of Quality who will ensure that all concerns are evaluated and, where necessary, brought to the attention of executive management and investigated. Any Pace employee can contact corporate management to report an ethical concern by calling the anonymous hotline at 612-607-6431.

1.11. Laboratory Safety

1.11.1. It is the policy of PASI to make safety and health an integral part of daily operations and to ensure that all employees are provided with safe working conditions, personal protective equipment, and requisite training to do their work without injury. Each employee is responsible for his/her own safety as well as those working in the immediate area by complying with established company rules and procedures. These rules and procedures as well as a more detailed description of the employees' responsibilities are contained in the corporate Safety Manual and Chemical Hygiene Plan.

1.12. Security and Confidentiality

1.12.1. Security is maintained by controlled access to laboratory buildings. Exterior doors to laboratory buildings remain either locked or continuously monitored by PASI staff. Keyless door lock combinations and computer access codes/logins are changed periodically. Posted signs direct visitors to the reception office and mark all other areas as off limits to unauthorized personnel. All visitors, including PASI staff from other facilities, must sign the Visitor's Logbook maintained by the receptionist. A staff member will accompany them during the duration of their stay on the premises unless the SGM/GM/AGM/OM, SQM/QM, or Technical Director specify otherwise. In this instance, the staff member will escort the visitor back to the reception area at the end of his/her visit where he/she signs out. The last staff member to leave their department for the day must ensure that all outside access points to that area are secure.

1.12.2. Additional security is provided where necessary, (e.g., specific secure areas for sample, data, and customer report storage), as requested by customers, or cases where national security is of concern. These areas are lockable within the facilities, or are securely offsite. Access is limited to specific individuals or their designees. Security of sample storage areas is the responsibility of the Sample Custodian. Security of samples and data during analysis and data reduction is the responsibility of Group Supervisors. Security of customer report archives is the responsibility of the Client Services Manager. These secure areas are locked whenever these individuals or their designees are not present in the facility.

1.12.3. Access to designated laboratory sample storage locations is limited to authorized personnel only. Provisions for lock and key access are provided. No samples are to be removed without proper authorization. If requested by customer or contract, samples are not to be removed from secure storage areas without filling out an associated internal chain of custody.

1.12.4. Standard business practices of confidentiality are applied to all documents and information regarding customer analyses. Specific protocols for handling confidential documents are described in PASI SOPs. Additional protocols for sample identification by internal laboratory identification numbers only are implemented as required under contract specific Quality Assurance Project Plans (QAPPs).

1.12.5. All information pertaining to a particular customer, including national security concerns will remain confidential. Data will be released to outside agencies only with written authorization from the customer or where federal or state law requires the company to do so.

1.13. Communications

1.13.1. Management within each lab bears the responsibility of ensuring that appropriate communication processes are established and that communication takes place regarding the effectiveness of the management/quality system. These communication processes may include email, regular staff meetings, senior management meetings, etc.

1.13.2. Corporate management bears the responsibility of ensuring that appropriate communication processes are established within the network of facilities and that communication takes place at a company-wide level regarding the effectiveness of the management/quality systems of all Pace facilities. These communication processes may include email, quarterly continuous improvement conference calls for all lab departments, and annual continuous improvement meetings for all department supervisors, quality managers, client services managers, and other support positions.

2.0. SAMPLE CUSTODY

2.1. Sampling Support

2.1.1. Each individual PASI laboratory provides shipping containers, properly preserved sample containers, custody documents, and field quality control samples to support field-sampling events. Guidelines for sample container types, preservatives, and holding times for a variety of methods are listed in Attachment VIII. Note that all analyses listed are not necessarily performed at all PASI laboratories and there may be additional laboratory analyses performed that are not included in these tables. Customers are encouraged to contact their local Pace Project Manager for questions or clarifications regarding sample handling. PASI - Minneapolis, Billings, Virginia and Duluth may provide pick-up and delivery services to their customers when needed.

2.2. Field Services

2.2.1. Pace Analytical has a large Field Services Division which is based in their Minneapolis facility as well as limited field service capabilities in some of our other facilities. Field Services provides comprehensive nationwide service offerings including:

- Stack Testing
- Ambient Air
- CEM Certification Testing
- Air Quality Monitoring
- Onsite Analytical Services- FTIR and GC
- Real-time Process Diagnostic/Optimization Testing
- Wastewater, Groundwater and Drinking Water Monitoring
- Storm Water and Surface Water Monitoring
- Soil and Waste Sampling
- Mobile Laboratory Services

2.2.2. Field Services operates under the PASI Corporate Quality System, with applicable and necessary provisions to address the activities, methods, and goals specific to Field Services. All procedures and methods used by Field Services are documented in Standard Operating Procedures and Procedure Manuals.

2.3. Project Initiation

2.3.1. Prior to accepting new work, the laboratory reviews its performance capability. The laboratory confirms that sufficient personnel, equipment capacity, analytical method capability, etc., are available to complete the required work. Customer needs, certification requirements, and data quality objectives are defined and the appropriate sampling and analysis plan is developed to meet the project requirements by project managers or sales representatives. Members of the management staff review current instrument capacity, personnel availability and training, analytical procedures capability, and projected sample load. Management then informs the sales and client services personnel whether or not the laboratory can accept the new project via written correspondence, email, and/or daily operations meetings.

2.3.2. The laboratory maintains records of all such reviews, including discussions with customers. Routine analytical project documentation of quotes, notes, dates, initials, and/or recordings is maintained in a project folder by project management. Conditions for new and more complex contracts are determined by the SGM/GM/AGM/OM and sales representatives. Quality Management is consulted on technical requirements and operations staff provides input on volume capacities. Evidence of these reviews is maintained in the form of awarded Request for Proposals (RFPs), signed quotes or contracts, and a Customer Relationship Management (CRM) database. If a review identifies a potential mismatch between customer requirements and laboratory capabilities and/or capacities, Pace will specify its level of commitment by listing these exceptions to the requirements within the RFP, quote or contract.

2.3.3. Additional information regarding specific procedures for reviewing new work requests can be found in SOP S-MN-Q-270 **Review of Analytical Requests** or its equivalent revision or replacement.

2.4. Chain of Custody

2.4.1. A chain of custody (COC) provides the legal documentation of samples from time of collection to completion of analysis. PASI has implemented Standard Operating Procedures to ensure that sample custody traceability and responsibility objectives are achieved for every project.

2.4.2. Field personnel or client representatives must complete a chain of custody for all samples that are received by the laboratory. The importance of completeness of COCs is stressed to the samplers and is critical to efficient sample receipt and to insure the requested methods are used to analyze the correct samples.

2.4.3. If sample shipments are not accompanied by the correct documentation, the Sample Receiving department notifies a Project Manager. The Project Manager then obtains the correct documentation/information from the customer in order for analysis of samples to proceed.

2.4.4. The sampler is responsible for providing the following information on the chain of custody form:

- Customer project name
- Project location or number
- Field sample number/identification
- Date and time sampled
- Sample matrix
- Preservative
- Requested analyses
- Sampler signature
- Relinquishing signature
- Date and time relinquished
- Sampler remarks as needed
- Custody Seal Number if present
- Regulatory Program Designation
- The state where the samples were collected to ensure all applicable state requirements are met
- Turnaround time requested
- Purchase order number

2.4.5. The COC is filled out completely and legibly with indelible ink. Errors are corrected by drawing a single line through the initial entry and initialing and dating the change. All transfers of samples are recorded on the chain of custody in the “relinquished” and “received by” sections. All information except signatures is printed.

2.4.6. Additional information can be found in S-MN-C-001 **Sample Management** or its equivalent revision or replacement.

2.5. Sample Acceptance Policy

2.5.1. In accordance with regulatory guidelines, PASI complies with the following sample acceptance policy for all samples received.

2.5.2. If the samples do not meet the sample receipt acceptance criteria outlined below, the laboratory is required to document all non-compliances, contact the customer, and either reject the samples or fully document any decisions to proceed with analyses of samples which do not meet the criteria. Any results reported from samples not meeting these criteria are appropriately qualified on the final report.

2.5.2.1. For Ohio VAP samples, the narrative for any report that includes qualified data must also include a discussion of any bias in the results.

2.5.3. All samples must:

- Have unique customer identification that is clearly marked with indelible ink on durable waterproof labels affixed to the sample containers that match the chain of custody.
- Have clear documentation on the chain of custody related to the location of the sampling site with the time and date of sample collection.
- Have the sampler’s name and signature.
- Have all requested analyses clearly designated on the COC.
- Have clear documentation of any special analytical or data reporting requirements.
- Be in appropriate sample containers with clear documentation of the preservatives used.
- Be correctly preserved unless the method allows for laboratory preservation.
- Be received within holding time. Any samples with hold times that are exceeded will not be processed without prior customer approval.
- Have sufficient sample volume to proceed with the analytical testing. If insufficient sample volume is received, analysis will not proceed without customer approval.
- Be received within appropriate temperature ranges - not frozen but ≤6°C (See Note 1), unless program requirements or customer contractual obligations mandate otherwise (see Note 2). The cooler temperature is recorded directly on the COC and the SCUR. Samples that are delivered to the laboratory immediately after collection are considered acceptable if there is evidence that the chilling process has been started. For example, by the arrival of the samples on ice. If samples arrive that are not compliant with these temperature requirements, the customer will be notified. The analysis will NOT proceed unless otherwise directed by the customer. If less than 72 hours remain in the hold time for the analysis, the analysis may be started while the customer is contacted to avoid missing the hold time. Data associated with any deviations from the above sample acceptance policy requirements will be appropriately qualified.

Note 1: Temperature will be read and recorded based on the precision of the measuring device. For example, temperatures obtained from a thermometer graduated to 0.1°C will be read and recorded to

±0.1°C. Measurements obtained from a thermometer graduate to 0.5°C will be read to ±0.5°C. Measurements read at the specified precision are not to be rounded down to meet the ≤6°C limit

Note 2: Some microbiology methods allow sample receipt temperatures of up to 10°C. Consult the specific method for microbiology samples received above 6°C prior to initiating corrective action for out of temperature preservation conditions.

Note 3: Biological Tissue Samples must be received frozen at ≤0°C.

2.5.4. Upon sample receipt, the following items are also checked and recorded:

- Presence of custody seals or tapes on the shipping containers;
- Sample condition: Intact, broken/leaking, bubbles in VOA samples;
- Sample holding time;
- Sample pH and residual chlorine when required;
- Appropriate containers.

2.5.5. Samples for drinking water analysis that are improperly preserved, or are received past holding time, are rejected at the time of receipt, with the exception of VOA samples that are tested for pH at the time of analysis.

2.5.6. Additional information can be found in S-MN-C-001 **Sample Management** or its equivalent revision or replacement.

2.6. Sample Log-in

2.6.1. After sample inspection, all sample information on the chain of custody is entered into the Laboratory Information Management System (LIMS). This permanent record documents receipt of all sample containers including:

- Customer name and contact
- Customer number
- Pace Analytical project number
- Pace Analytical Project Manager
- Sample descriptions
- Due dates
- List of analyses requested
- Date and time of laboratory receipt
- Field ID code
- Date and time of collection
- Any comments resulting from inspection for sample rejection

2.6.2. All samples received are logged into the LIMS within one working day of receipt. Sample login may be delayed due to customer clarification of analysis needed, corrective actions for sample receipt non-conformance, or other unusual circumstances. If the time collected for any sample is unspecified and Pace is unable to obtain this information from the customer, the laboratory will use 00:00 as the time sampled. All hold times will be based on this sampling time and qualified accordingly if exceeded.

2.6.3. For DoD work, if the time of the sample collection is not provided, the laboratory must assume the most conservative time of day. This is defined as 12:01am.

2.6.4. The LIMS automatically generates a unique identification number for each sample created in the system. The LIMS sample number follows the general convention of BB-XXXXXX-YYY. The BB represents the laboratory identification within Pace's laboratory network. The 5 digit "X" number represents the project number followed by a 3 digit sample number. The project number is a sequential number that is assigned as a new project is created. The sample number corresponds to the number of samples submitted by the client. In addition to the unique sample ID, there is a sample container ID that consists of the sample number, the container type (e.g. BP1U), and bottle 1 of Y, where Y represents the total number of containers of that particular type. Together the sample LIMs number and sample container ID number create a unique barcode encryption that can be linked to the sample analysis requested by the client. This unique identification number is placed on the sample container as a durable label and becomes the link between the laboratory's sample management system and the customer's field identification; it will be a permanent reference number for all future interactions.

2.6.5. Current division codes are noted below. These division codes are used primarily for accounting purposes and LIMS sample identifications. For smaller facilities, these codes may be used primarily for accounting purposes. More division codes may be added, revised or removed without updating this document.

00 = Corporate	50 = Indianapolis/Columbus
10 = Minnesota/Montana	51 = Columbus (accounting only)
12 = Virginia/Duluth MN	55/56 = Pace Energy Labs
20 = New Orleans/Puerto Rico	60 = Kansas
30 = Pittsburgh	65 = New York (Schenectady)
35 = Florida/South Florida	70 = Long Island
36 = South Florida (accounting only)	75 = Dallas
40 = Green Bay	92 = Carolinas

2.6.6. Sample labels are printed from the LIMS and affixed to each sample container.

2.6.7. Samples with hold times that are near expiration date/time may be sent directly to the laboratory for analysis at the discretion of the Project Manager and/or SGM/GM/AGM/OM.

2.6.8. Additional information can be found in S-MN-C-001 **Sample Management** or its equivalent revision or replacement.

2.7. Sample Storage

2.7.1. Storage Conditions

2.7.1.1. Samples are stored away from all standards, reagents, or other potential sources of contamination. Samples are stored in a manner that prevents cross contamination. Volatile samples are stored separately from other samples. All sample fractions, extracts, leachates, and other sample preparation products are stored in the same manner as actual samples or as specified by the analytical method.

2.7.1.2. Storage blanks, consisting of two 40mL aliquots of reagent water, are stored with volatile samples and are used to measure cross-contamination acquired during storage. If applicable, laboratories must have documented procedures and criteria for evaluating storage blanks, appropriate to the types of samples being stored.

2.7.1.3. Additional information can be found in S-MN-Q-263 **Monitoring Temperature Controlled Units.**

2.7.2. Temperature Monitoring

2.7.2.1. Samples are taken to the appropriate storage location immediately after sample receipt and check-in procedures are completed. All sample storage areas are located in limited access areas and are monitored to ensure sample integrity.

2.7.2.2. The temperature of each refrigerated storage area is maintained at ≤6°C (but above freezing) unless state or program requirements differ. The temperature of each freezer storage area is maintained at <-10°C unless state or program requirements differ. The temperature of each storage area is checked and documented each day of use (each calendar day). If the temperature falls outside the acceptable limits, the following corrective actions are taken and appropriately documented:

- The temperature is rechecked after two hours to verify temperature exceedance. Corrective action is initiated and documented if necessary.
- The SQM/QM and/or laboratory management are notified if the problem persists.
- The samples are relocated to a proper environment if the temperature cannot be maintained after corrective actions are implemented.
- The affected customers are notified.
- Documentation is provided on analytical report.

Additional information can be found in S-MN-Q-263 **Monitoring Temperature Controlled Units.**

2.7.3. Hazardous Materials

2.7.3.1. Pure product or potentially heavily contaminated samples must be tagged as "hazardous" or "lab pack" and stored separately from other samples.

2.7.4. Foreign/Quarantined Soils

2.7.4.1. Depending on the soil disposal practices of the laboratory, foreign soils and soils from USDA regulated areas are adequately segregated to enable proper sample disposal. The USDA requires these samples to be incinerated or sterilized by an approved treatment procedure. Additional information regarding USDA regulations and sample handling can be found in applicable local laboratory SOPs.

2.7.4.2. Additional information on sample storage can be found in S-MN-C-001 **Sample Management** or its equivalent revision or replacement and in S-MN-S-003 **Waste Handling and Management**.

2.8. Sample Protection

2.8.1. PASI laboratory facilities are operated under controlled access protocols to ensure sample and data integrity. Visitors must register at the front desk and be properly escorted at all times.

2.8.2. Samples are removed from storage areas by designated personnel and returned to the storage areas, if necessary, immediately after the required sample quantity has been taken.

2.8.3. Upon customer request, additional and more rigorous chain of custody protocols for samples and data can be implemented. For example, some projects may require internal chain-of-custody protocols.

2.8.4. Additional information can be found in S-MN-C-001 **Sample Management** or its equivalent revision or replacement.

2.9. Subcontracting Analytical Services

2.9.1. Every effort is made to perform all analyses for PASI customers within the laboratory that receives the samples. When subcontracting to a laboratory other than the receiving laboratory, whether inside or outside the PASI network, becomes necessary, a preliminary verbal communication with that laboratory is undertaken. Customers are notified in writing of the laboratory's intention to subcontract any portion of the testing to another laboratory. Work performed under specific protocols may involve special considerations.

2.9.2. Prior to subcontracting samples to a laboratory outside Pace Analytical, the potential sub-contract laboratory will be pre-qualified by verifying that the subcontractor meets the following criteria:

- All certifications required for the proposed subcontract are in effect,
- Sufficient professional liability and other required insurance coverage is in effect, and
- Is not involved in legal action by any federal, state, or local government agency for data integrity issues and has not been convicted in such investigation at any time during the past 5 years.

2.9.3. The contact and preliminary arrangements are made between the PASI Project Manager and the appropriate subcontract laboratory personnel. The specific terms of the subcontract laboratory agreement include:

- Method of analysis
- Number and type of samples expected
- Project specific QA/QC requirements
- Deliverables required
- Laboratory certification requirement
- Price per analysis
- Turn-around time requirements

2.9.4. Chain-of-custody forms are generated for samples requiring subcontracting to other laboratories. Sample receiving personnel re-package the samples for shipment, create a transfer chain of custody form and record the following information:

- Pace Analytical Laboratory Number
- Matrix
- Requested analysis
- Special instructions regarding turnaround, required detection or reporting limits, or any unusual information known about the samples or analytical procedure.
- Signature in "Relinquished By"

2.9.5. All subcontracted sample data reports are sent to the PASI Project Manager. Pace will provide a copy of the subcontractor's report to the client when requested.

2.9.6. Any Pace Analytical work sent to other labs within the PASI network is handled as subcontracted work and all final reports are labeled clearly with the name of the laboratory performing the work. Any non-TNI work is clearly identified. PASI will not be responsible for analytical data if the subcontract laboratory was designated by the customer.

2.9.7. Additional information can be found in S-MN-C-004 **Subcontracting Samples** or its equivalent revision or replacement.

2.9.8. Subcontracted labs used for DoD work must be accredited by DoD or its designated representatives. Subcontracted labs must receive project specific approval from the DoD client before any samples are analyzed. These requirements also apply to the use of any laboratory under the same corporate umbrella, but at a different facility or location.

2.10. Sample Retention and Disposal

2.10.1. Samples, extracts, digestates, and leachates must be retained by the laboratory for the period of time necessary to protect the interests of the laboratory and the customer.

- Air canisters are submitted for cleaning upon data validation. Due to media capacity, air canister samples are not retained as standard environmental samples.

2.10.2. Unused portions of samples are retained by each laboratory based on program or customer requirements for sample retention and storage. The minimum sample retention time is 45 days from receipt of the samples. Samples requiring thermal preservation may be stored at ambient temperature when the hold time is expired, the report has been delivered, and/or allowed by the customer, program, or contract. Samples requiring storage beyond the minimum sample retention time due to special requests or contractual obligations may be stored at ambient temperature unless the laboratory has sufficient capacity and their presence does not compromise the integrity of other samples.

2.10.3. After this period expires, non-hazardous samples are properly disposed of as non-hazardous waste. The preferred method for disposition of hazardous samples is to return the excess sample to the customer. If it is not feasible to return samples, or the customer requires PASI to dispose of excess samples, proper arrangements will be made for disposal by an approved contractor.

2.10.4. Additional information can be found in S-MN-S-003 **Waste Handling and Management** and S-MN-C-001 or their equivalent revisions or replacements.

3.0. ANALYTICAL CAPABILITIES

3.1. Analytical Method Sources

3.1.1. PASI laboratories are capable of analyzing a full range of environmental samples from a variety of matrices, including air, surface water, wastewater, groundwater, soil, sediment, biota, and other waste products. The latest valid editions of methodologies are applied from regulatory and professional sources including EPA, ASTM, USGS, NIOSH, Standard Methods, and State Agencies. Section 11 is a representative listing of general analytical protocol references. PASI discloses in writing to its customers and regulatory agencies any instances in which modified methods are being used in the analysis of samples.

3.1.2. In the event of a customer-specific need, instrumentation constraint or regulatory requirement, PASI laboratories reserve the right to use valid versions of methods that may not be the most recent edition available.

3.2. Analytical Method Documentation

3.2.1. The primary form of PASI laboratory documentation of analytical methods is the Standard Operating Procedure (SOP). SOPs contain pertinent information as to what steps are required by an analyst to successfully perform a procedure. The required contents for the SOPs are specified in the company-wide SOP for Preparation of SOPs (S-ALL-Q-001).

3.2.2. The SOPs may be supplemented by other training materials that further detail how methods are specifically performed. This training material will undergo periodic, documented review along with the other Quality System documentation.

3.3. Analytical Method Validation and Instrument Validation

3.3.1. In some situations, PASI develops and validates methodologies that may be more applicable to a specific problem or objective. When non-standard methods are required for specific projects or analytes of interest, or when the laboratory develops or modifies a method, the laboratory validates the method prior to applying it to customer samples. Method validity is established by meeting criteria for precision and accuracy as established by the data quality objectives specified by the end user of the data. The laboratory records the validation procedure, the results obtained and a statement as to the usability of the method. The minimum requirements for method validation include evaluation of sensitivity, quantitation, precision, bias, and selectivity of each analyte of interest.

3.3.2. Additional information can be found in SOP S-MN-Q-252 **Method Validation and Modification Studies**, or equivalent replacement.

3.4. Demonstration of Capability (DOC)

3.4.1. Analysts complete an initial demonstration of capability (IDOC) study prior to performing a method or when there is a change in instrument type, personnel, or test method, or at any time that a method has not been performed by the laboratory or analyst in a 12-month period. The mean recovery and standard deviation of each analyte, taken from 4 replicates of a quality control standard is calculated and compared to method criteria (if available) or established laboratory criteria for evaluation of acceptance. Each laboratory maintains copies of all demonstrations of capability, including those that fail acceptance criteria and corresponding raw data for future reference and must document the acceptance criteria prior to the analysis of the DOC. Demonstrations of capability are verified on an annual basis.

3.4.2. For Continuing Demonstrations of Capability, the laboratories may use Performance Testing (PT) samples in lieu of the 4-replicate approach listed above. For methods or procedures that do not lend themselves to the "4-replicate" approach, the demonstration of capability requirements will be specified in the applicable SOP. Drinking Water DOCs must be done at or below the MCL.

3.4.3. Additional information can be found in SOP S-ALL-Q-020 **Training and Employee Orientation** or its equivalent revision or replacement.

3.5. Regulatory and Method Compliance

3.5.1. PASI understands that expectations of our customers commonly include the assumption that laboratory data will satisfy specific regulatory requirements. Therefore PASI attempts to ascertain, prior to beginning a project, what applicable regulatory jurisdiction, agency, or protocols apply to that project. This information is also required on the chain of custody submitted with samples.

3.5.2. PASI makes every effort to detect regulatory or project plan inconsistencies, based upon information from the customer, and communicate them immediately to the customer in order to aid in the decision making process. PASI will not be liable if the customer chooses not to follow PASI recommendations.

3.5.3. It is PASI policy to disclose in a forthright manner any detected noncompliance affecting the usability of data produced by our laboratories. The laboratory will notify customers within 30 days of fully characterizing the nature of the nonconformance, the scope of the nonconformance and the impact it may have on data usability.

4.0. QUALITY CONTROL PROCEDURES

The method SOPs will define the following criteria in a more detailed procedures for the corrective actions as applicable to each analytical method. Quality control data is analyzed and where they are found to be outside pre-defined criteria, planned action is taken to correct the problem in order to prevent incorrect results from being reported. Quality control samples are to be processed in the same manner as client samples.

4.1. Method Blank

4.1.1. A method blank is used to evaluate contamination in the preparation/analysis system and is processed through all preparation and analytical steps with its associated samples.

4.1.2. A method blank is processed at a minimum frequency of one per preparation batch (see glossary section of this document for further clarification of the definition of batch). In the case of a method that has no separate preparation step, a method blank is processed with no more than 20 samples of a specific matrix performed by the same analyst, using the same method, standards, and reagents.

4.1.3. The method blank consists of a matrix similar to the associated samples that is known to be free of analytes of interest. Method blanks are not applicable for certain analyses, such as pH, conductivity, flash point and temperature.

4.1.4. Each method blank is evaluated for contamination. The source of any contamination is investigated and documented corrective action is taken when the concentration of any target analyte is detected above the reporting limit and is greater than 1/10 of the amount of that analyte found in any associated sample. Some labs, due to client requirements, etc., may have to evaluate their method blanks down to ½ the reporting limit or down to the method detection limit as opposed to the reporting limit itself. Corrective actions for blank contamination may include the re-preparation and re-analysis of all samples (where possible) and quality control samples. Data qualifiers must be applied to results that are considered affected by contamination in a method blank.

4.1.5. For DoD samples, the method blank will be considered to be contaminated if: 1) The concentration of any target analyte in the blank exceeds 1/2 the reporting limit and is greater than 1/10 the amount measured in any sample or 1/10 the regulatory limit whichever is greater; 2) The concentration of any common laboratory contaminant in the blank exceeds the reporting limit and is greater than 1/10 the amount measured in any sample or 1/10 the regulatory limit whichever is greater or 3) The blank result otherwise affects the sample results as per the test method requirements or the project-specific objectives. If the method blank is contaminated as described above, then the laboratory shall reprocess affected samples in a subsequent preparation batch, except when sample results are below the LOD. If insufficient sample volume remains for reprocessing, the results shall be reported with appropriate data qualifiers.

4.1.6. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.1.7. For Ohio VAP projects, the laboratory must minimize the use of qualified data. In the case of method blank having any reportable contamination, the laboratory is required to reanalyze the associated samples with an acceptable method blank if there is sufficient sample remaining. Acceptable method blanks are those that are free of contamination below the reporting limit. The laboratory must make every effort to take the appropriate corrective actions and resolve any anomalies regarding method blanks for Ohio VAP projects. The narrative for any report that includes qualified data must also include a discussion of any bias in the results.

4.2. Laboratory Control Sample

4.2.1. The Laboratory Control Sample (LCS) is used to evaluate the performance of the entire analytical system including preparation and analysis.

4.2.2. An LCS is processed at a minimum frequency of one per preparation batch. In the case of a method that has no separate preparation step, an LCS will be processed with no more than 20 samples of a specific matrix performed by the same analyst, using the same method, standards, and reagents.

4.2.3. The LCS consists of a matrix similar to the associated samples that is known to be free of the analytes of interest that is then spiked with known concentrations of target analytes.

4.2.4. The LCS contains **all** analytes specified by a specific method or by the customer or regulatory agency, which may include full list of target compounds, with certain exceptions. These exceptions may include analyzing only specific Aroclors when PCB analysis is requested or not spiking with all EPA Appendix IX compounds when a full Appendix IX list of compounds is requested. However, the lab must ensure that all target components in its scope of accreditation are included in the spike mixture for the LCS over a two (2) year period. In the absence of specified components, the laboratory will spike the LCS with the following compounds:

- For multi-peak analytes (e.g. PCBs, technical chlordane, toxaphene), a representative standard will be processed.
- For methods with long lists of analytes, a representative number of target analytes may be chosen. The following criteria is used to determine the number of LCS compounds used:
  - For methods with 1-10 target compounds, the laboratory will spike with all compounds;
  - For methods with 11-20 target compounds, the laboratory will spike with at least 10 compounds or 80%, whichever is greater;
  - For methods with greater than 20 compounds, the laboratory will spike with at least 16 compounds.

4.2.5. The LCS is evaluated against the method default or laboratory-derived acceptance criteria. For those methods that require laboratory-derived limits, method default control limits may be used until the laboratory has a minimum of 20, but preferably greater than 30, data points from which to derive internal acceptance criteria. Any compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Any associated sample containing an 'out-of-control' compound must either be re-analyzed with a successful LCS or reported with the appropriate data qualifier. When the acceptance criteria for the LCS are exceeded high, and there are associated samples that are non-detects, then those non-detects can be reported with data qualifiers, or when the acceptance criteria are exceeded low, those associated sample results may be reported if they exceed the maximum regulatory limit/decision level with data qualifiers.

4.2.6. For LCSs containing a large number of analytes, it is statistically likely that a few recoveries will be outside of control limits. This does not necessarily mean that the system is out of control, and therefore no corrective action would be necessary (except for proper documentation). TNI has allowed for a minimum number of marginal exceedances, defined as recoveries that are beyond the LCS control limits (3X the standard deviation) but less than the marginal exceedance limits (4X the standard deviation). The number of allowable exceedances depends on the number of compounds in the LCS. If more analyte recoveries exceed the LCS control limits than is allowed (see below) or if any one analyte exceeds the marginal exceedance limits, then the LCS is considered non-compliant and corrective actions are necessary. The number of allowable exceedances is as follows:

- >90 analytes in the LCS- 5 analytes
- 71-90 analytes in the LCS- 4 analytes
- 51-70 analytes in the LCS- 3 analytes
- 31-50 analytes in the LCS- 2 analytes
- 11-30 analytes in the LCS- 1 analyte
- <11 analytes in the LCS- no analytes allowed out)

4.2.7. A matrix spike (MS) can be used in place of a non-compliant LCS in a batch as long as the MS passes the LCS acceptance criteria (this is a TNI allowance). When this happens, full documentation must be made available to the data user. If this is not allowed by a customer or regulatory body, the associated samples must be rerun with a compliant LCS (if possible) or reported with appropriate data qualifiers.

4.2.8. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.2.9. For Ohio VAP projects, the laboratory must minimize the use of qualified data. In the case of LCS failures, the laboratory is required to reanalyze the associated samples with an acceptable LCS for all target compounds if there is sufficient sample remaining. The laboratory must make every effort to take the appropriate corrective actions and resolve any anomalies regarding LCSs for Ohio VAP projects. The narrative for any report that includes qualified data must also include a discussion of any bias in the results.

- For Ohio VAP projects, the MS cannot be used in place of the LCS.

4.2.10. For Department of Defense projects, the laboratory is not allowed to have any target analytes that exceed DoD LCS control limits. In the case of LCS failures, the laboratory is required to reanalyze the associated samples with an acceptable LCS for all target compounds if there is sufficient sample remaining. The laboratory must make every effort to take the appropriate corrective actions and resolve any anomalies regarding LCSs for Department of Defense projects. All LCS failures must be accounted for in project case narratives. See applicable method SOPs for further corrective action.

4.3. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

4.3.1. A matrix spike (MS) is used to determine the effect of the sample matrix on compound recovery for a particular method. The information from these spikes is sample or matrix specific and is not used to determine the acceptance of an entire batch unless the MS is actually used as the LCS.

4.3.2. A **Matrix Spike/Matrix Spike Duplicate** (MS/MSD) set is processed at a frequency specified in a particular method or as determined by a specific customer request. This frequency will be specified in the applicable method SOP or customer QAPP. In the absence of such requirements, an MS/MSD set is routinely analyzed once per every 20 samples per matrix per method.

4.3.3. The MS and MSD consist of the sample matrix that is then spiked with known concentrations of target analytes. Laboratory personnel spike customer samples that are specifically designated as MS/MSD samples or, when no designated samples are present in a batch, randomly select samples to spike that have adequate sample volume or weight. Spiked samples are prepared and analyzed in the same manner as the original samples and are selected from different customers if possible.

4.3.4. The MS and MSD contain all analytes specified by a specific method or by the customer or regulatory agency. In the absence of specified components, the laboratory will spike the MS/MSD with the same number of compounds as previously discussed in the LCS section. However, the lab must ensure that all targeted components in its scope of accreditation are included in the spike mixture for the MS/MSD over a two (2) year period.

4.3.5. The MS and MSD are evaluated against the method or laboratory derived criteria. Any compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Batch acceptance, however, is based on method blank and LCS performance, not on MS/MSD recoveries. The spike recoveries give the data user a better understanding of the final results based on their site specific information.

4.3.6. A matrix spike and sample duplicate will be performed instead of a matrix spike and matrix spike duplicate when specified by the customer or method.

4.3.7. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.3.8. For Ohio VAP projects, the laboratory must minimize the use of qualified data. In the case of MS/MSD failures, the laboratory is required to reanalyze the associated samples only when the associated LCS also fails acceptance criteria and if there is sufficient sample remaining. When an LCS is acceptable and the MS results are outside of criteria, and no system anomaly is detected, the samples will be reported with appropriate data qualifiers indicating matrix interference. The laboratory must make every effort to take the appropriate corrective actions and resolve any anomalies regarding LCSs for Ohio VAP projects.

- For Ohio VAP projects MS/MSD are optional and will be directed by the Certified Professional.

4.3.9. For DoD work, each preparation batch of samples must contain an associated MS and MSD (or sample duplicate) using the same matrix collected for the specific DoD project. If adequate sample material is not available, then the lack of MS/MSDs shall be noted in the case narrative. Additional MS/MSDs may be required on a project-specific basis. The MS/MSD must be spiked with all target analytes with the exception of PCB analysis, which is spiked per the method. The concentration of the spiked compounds shall be at or below the midpoint of the calibration range or at the appropriate concentration of concern. Multiple spiked samples may need to be prepared to avoid interferences.

4.3.10. For DoD work, the results of all MS/MSD must be evaluated using the same acceptance criteria used for the LCS.

4.4. Sample Duplicate

4.4.1. A sample duplicate is a second portion of sample that is prepared and analyzed in the laboratory along with the first portion. It is used to measure the precision associated with preparation and analysis. A sample duplicate is processed at a frequency specified by the particular method or as determined by a specific customer.

- For Ohio VAP projects Sample duplicate is optional and will be directed by the Certified Professional.

4.4.2. The sample and duplicate are evaluated against the method or laboratory derived criteria for relative percent difference (RPD). Any duplicate that is outside of these limits is considered to be 'out of control' and must be qualified appropriately.

4.4.3. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.4.4. For Ohio VAP projects, the laboratory must minimize the use of qualified data. In the case of duplicate samples exceeding the RPD criteria found in applicable analytical SOPs, the laboratory is required to reanalyze the associated sample and duplicate as long as no sampling error was detected if there is sufficient sample remaining. If the sample and duplicate still do not agree, a comment would be made stating there may be sample non-homogeneity. The laboratory must make every effort to take the appropriate corrective actions and resolve any anomalies regarding sample duplicates for Ohio VAP projects. The narrative for any report that includes qualified data must also include a discussion of any bias in the results.

4.5. Surrogates

4.5.1. Surrogates are compounds that reflect the chemistry of target analytes and are typically added to samples for organic analyses to monitor the effect of the sample matrix on compound recovery.

4.5.1.1. Surrogates are added to each customer sample (for applicable organics), method blank, LCS, MS, and calibration standard prior to extraction or analysis. The surrogates are evaluated against the method or laboratory derived acceptance criteria or against project-specific acceptance criteria specified by the client, if applicable. Any surrogate compound that is outside of these limits is considered to be 'out of control' and must be qualified appropriately. Samples with surrogate failures are typically re-extracted and/or re-analyzed to confirm that the out-of-control value was caused by the matrix of the sample and not by some other systematic error. An exception to this would be samples that have high surrogate values but no reportable hits for target compounds. These samples would be reported, with a qualifier, because the implied high bias would not affect the final results. For methods with multiple surrogates, documentation regarding acceptance and associated compounds will be found in the individual method SOPs.

4.5.1.2. For Ohio VAP samples, the narrative for any report that includes qualified data must also include a discussion of any bias in the results.

4.5.1.3. For the TO-15 method, surrogates are not evaluated for Ohio VAP samples.

4.5.2. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.6. Internal Standards

4.6.1. Internal Standards are method-specific analytes added to every standard, method blank, laboratory control sample, matrix spike, matrix spike duplicate, sample, and calibration standard at a known concentration, prior to analysis for the purpose of adjusting the response factor used in quantifying target analytes. At a minimum, the laboratory will follow method specific guidelines for the treatment of internal standard recoveries as they are related to the reporting of data. Deviations made from this policy must be approved by the SQM/QM prior to release of the data.

4.6.2. For Ohio VAP projects, samples with internal standard that are outside of method criteria must be reanalyzed to confirm sample matrix effect. The laboratory must make every effort to take the appropriate corrective actions and resolve any anomalies regarding internal standards for Ohio VAP projects. The narrative for any report that includes qualified data must also include a discussion of any bias in the results.

4.7. Field Blanks

4.7.1. Field blanks are blanks prepared at the sampling site in order to monitor for contamination that may be present in the environment where samples are collected. These field quality control samples are often referenced as field blanks, rinsate blanks, or equipment blanks. The laboratory analyzes these field blanks as normal samples and informs the customer if there are any target compounds detected above the reporting limits.

4.8. Trip Blanks

4.8.1. Trip blanks are blanks that originate from the laboratory as part of the sampling event and are used to monitor for contamination of samples during transport. These blanks accompany the empty sample containers to the field and then accompany the collected samples back to the laboratory. These blanks are routinely analyzed for volatile methods where ambient background contamination is likely to occur.

4.9. Limit of Detection (LOD)

4.9.1. PASI laboratories are required to use a documented procedure to determine a limit of detection for each analyte of concern in each matrix reported. All sample processing steps of the preparation and analytical methods are included in this determination including any clean ups. For any test that does not have a valid LOD, sample results below the limit of quantitation (LOQ) cannot be reported.

4.9.2. The LOD is initially established for the compounds of interest for each method in a clean matrix with no target analytes present and no interferences at a concentration that would impact the results. The LOD is then determined every time there is a change in the test method that affects how the test is performed or when there has been a change in the instrument that affects the sensitivity. If required by customer, method or accreditation body, the LOD will be re-established annually for all applicable methods.

4.9.3. Unless otherwise noted, the method used by PASI laboratories to determine LODs is based on the Method Detection Limit (MDL) procedure outlined in 40 CFR Part 136, Appendix B. Where required by regulatory program or customer, the above referenced procedure will be followed.

4.9.4. Where specifically stated in the published method, LODs or MDLs will be performed at the listed frequency.

4.9.5. The validity of the LOD must be shown by detection (a value above zero) of the analytes in a QC sample in each quality system matrix. The QC sample must contain the analyte at no more than 3X the LOD for a single analyte test and 4X the LOD for multiple analyte tests. This verification must be performed on each instrument used for sample analysis and reporting of data. The validity of the LOD must be verified as part of the LOD determination process. This verification must be done prior to the use of the LOD for sample analysis.

4.9.6. An LOD study is not required for any analyte for which spiking solutions or quality control samples are not available such as temperature.

4.9.7. The LOD, if required, shall be verified annually for each quality system matrix, technology and analyte. In lieu of performing full LOD (MDL) studies annually, the laboratory can verify the LOD (MDL) on an annual basis, providing this verification is fully documented and does not contradict other customer or program requirements that the laboratory must follow. The requirements of this verification are:

- The spike concentration of the verification must be no more than 3X times the LOD for single analyte tests and 4X the LOD for multiple analyte tests.
- The laboratory must verify the LOD on each instrument used for the reporting of sample data.
- The laboratory must be able to identify all target analytes in the verification standard (distinguishable from noise).

4.9.8. For Ohio VAP projects, a valid MDL must be in place prior to sample analysis. MDLs must be spiked at or below the reporting limit and will not be accepted if it was spike higher than the reporting limit.

4.9.9. DoD definition for LOD- The smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate is 1%.

4.9.10. Additional information can be found in SOP S-MN-Q-269 **Determination of LOD and LOQ** or its equivalent revision or replacement.

4.10. Limit of Quantitation (LOQ)

4.10.1. A limit of quantitation (LOQ) for every analyte of concern must be determined. For PASI laboratories, this LOQ is referred to as the RL, or Reporting Limit. This RL is based on the lowest calibration standard concentration that is used in each initial calibration. Results below this level are not allowed to be reported without qualification since the results would not be substantiated by a calibration standard. For methods with a determined LOD, results can be reported out below the LOQ but above the LOD if they are properly qualified (e.g., J flag).

4.10.2. The LOQ must be higher than the LOD.

4.10.3. To verify the LOQ, the laboratory will prepare a sample in the same matrix used for the LCS. The sample will be spiked with each target analyte at a concentration equivalent to the RL or 2X the RL. This sample must undergo the routine sample preparation procedure including any routine sample cleanup steps. The sample is then analyzed and the recovery of each target analyte determined. The recovery for each target analyte must meet the laboratories current control limits for an LCS. The annual LOQ verification is not required if the LOD was determined or verified annually on that instrument.

4.10.4. For DoD approved methods, the LOQ and LOD shall be verified quarterly and valid LOQ must be in place prior to sample analysis.

4.10.5. Additional information can be found in SOP S-MN-Q-269 **Determination of LOD and LOQ** or its equivalent revision or replacement.

4.11. Estimate of Analytical Uncertainty

4.11.1. PASI laboratories can provide an estimation of uncertainty for results generated by the laboratory. The estimate quantifies the error associated with any given result at a 95% confidence interval. This estimate does not include bias that may be associated with sampling. The laboratory has a procedure in place for making this estimation. In the absence of a regulatory or customer-specific procedure, PASI laboratories base this estimation on the recovery data obtained from the Laboratory Control Spikes. The uncertainty is a function of the standard deviation of the recoveries multiplied by the appropriate Student's t Factor at 95% confidence. Additional information pertaining to the estimation of uncertainty and the exact manner in which it is derived are contained in the SOP S-MN-Q-255 **Estimation of Measurement Uncertainty** or its equivalent revision or replacement.

4.11.2. The measurement of uncertainty is provided only on request by the customer, as required by specification or regulation and when the result is used to determine conformance within a specification limit.

4.12. Proficiency Testing (PT) Studies

4.12.1. PASI laboratories participate in the TNI defined proficiency testing program. PT samples are obtained from TNI and state regulatory approved providers and analyzed and reported at a minimum of two times per year for the relevant fields of testing per matrix.

4.12.2. The laboratory initiates an investigation whenever PT results are deemed 'unacceptable' by the PT provider. All findings and corrective actions taken are reported to the SQM/QM or their designee. A corrective action plan is initiated and this report is sent to the appropriate state accreditation agencies for their review. Additional PTs will be analyzed and reported as needed for certification purposes.

4.12.3. PT samples are treated as typical customer samples, utilizing the same staff, methods, equipment, facilities, and frequency of analysis. PT samples are included in the laboratory's normal analytical processes and do not receive extraordinary attention due to their nature.

4.12.4. Comparison of analytical results with anyone participating in the same PT study is prohibited prior to the close of the study.

4.12.5. Additional information can be found in SOP S-MN-Q-258 **Proficiency Testing Program** or its equivalent revision or replacement.

4.13. Rounding and Significant Figures

4.13.1. In general, the PASI laboratories report data to no more than three significant digits. Therefore, all measurements made in the analytical process must reflect this level of precision. In the event that a parameter that contributes to the final result has less than three significant figures of precision, the final result must be reported with no more significant figures than that of the parameter in question. The rounding rules listed below are descriptive of the LIMS and not necessarily of any supporting program such as Excel.

4.13.2. Data is compared to the reporting limits and MDLs to determine if qualifiers are needed before the rounding step occurs.

4.13.3. **Rounding:** PASI- Minneapolis, Billings, Virginia and Duluth follow the odd / even guidelines for rounding numbers:

- If the figure following the one to be retained is less than five, that figure is dropped and the retained ones are not changed (with three significant figures, 2.544 is rounded to 2.54).
- If the figure following the ones to be retained is greater than five, that figure is dropped and the last retained one is rounded up (with three significant figures, 2.546 is rounded to 2.55).
- If the figure following the ones to be retained is five and if there are no figures other than zeros beyond that five, then the five is dropped and the last figure retained is unchanged if it is even and rounded up if it is odd (with three significant figures, 2.525 is rounded to 2.52 and 2.535 is rounded to 2.54).

4.13.4. **Significant Digits**

4.13.4.1. PASI- Minneapolis, Billings, Virginia and Duluth follow the following convention for reporting to a specified number of significant figures. Unless specified by federal, state, or local requirements or on specific request by a customer, the laboratory reports:

Values > 10 – Reported to 3 significant digits
Values ≤ 10 – Reported to 2 significant digits

4.14. Retention Time Windows

4.14.1. When chromatographic conditions are changed, retention times and analytical separations are often affected. As a result, two critical aspects of any chromatographic method are the determination and verification of retention times and analyte separation. Retention time windows must be established for the identification of target analytes. The retention times of all target analytes in all calibration verification standards must fall within the retention time windows. If an analyte falls outside the retention time window in an ICV or CCV, new absolute retention time windows must be calculated, unless instrument maintenance fixes the problem. When a new column is installed, a new retention time window study must be performed.

4.14.2. One process for the production of retention time windows: Make 3 injections of all single component or multi-component analytes over a 72-hour period. Record the retention time in minutes for each analyte and surrogate to 3 decimal places. Calculate the mean and standard deviation of the three absolute retention times for each target analyte and surrogate. For multi-component analytes, choose 3-5 major peaks and calculate the mean and standard deviation for each of the peaks. If the standard deviation of the retention times of a target analyte is 0.000, the lab may use a default standard deviation of 0.01. The width of the retention time window for each analyte and surrogate and major peak in a multi-component analyte is defined as +/- 3 times the standard deviation of the mean absolute retention time established during that 72-hour period or 0.03 minutes, whichever is greater.

4.14.3. The center of the retention time window is established for each analyte and surrogate by using the absolute retention times from the CCV at the beginning of the analytical shift. For samples run with an initial calibration, use the retention time of the mid-point standard of the initial calibration curve.

4.14.4. For more information, please reference the local facility's analytical SOPs.

5.0. DOCUMENT MANAGEMENT AND CHANGE CONTROL

5.1. Document Management

5.1.1. Additional information can be found in SOP S-MN-Q-258 **Document Control and Management** or its equivalent revision or replacement. Information on Pace's policy for electronic signatures can also be found in this SOP.

5.1.2. Pace Analytical Services, Inc. has an established procedure for managing documents that are part of the quality system. The list of managed documents includes, but is not limited to, Standard Operating Procedures (both technical and non-technical), Quality Assurance Manuals, quality policy statements, training documents, work-processing documents, charts, posters, memoranda, notices, forms, software, and any other procedures, tables, plans, etc. that have a direct bearing on the quality system (including applicable data records and non-technical documents).

5.1.3. A master list of all managed documents is maintained at each facility identifying the current revision status and distribution of the controlled documents. This establishes that there are no invalid or obsolete documents in use in the facility. All documents are reviewed periodically and revised if necessary. Obsolete documents are systematically discarded or archived for audit or knowledge preservation purposes. Copies of all quality systems documentation provided to DoD for review must be in English.

5.1.4. Each managed document is uniquely identified to include the date of issue, the revision identification, page numbers, the total number of pages and the issuing authorities. For complete information on document numbering, refer to SOP S-MN-Q-258 **Document Numbering**.

5.1.5. SOPs, specifically, are available to all laboratory staff via the Learning Management System (LMS) which is a secure repository that is accessed through an internet portal. As a local alternative to the hard copy system of controlled documents, secured electronic copies of controlled documents may be maintained on the laboratory's local server. These document files must be read-only for all personnel except the Quality Department and system administrator. Other requirements for this system are as follows:

- Electronic documents must be readily accessible to all facility employees.
- Electronic documents must be locked from printing. All hardcopy SOPs must be obtained from the Quality Department.

5.1.6. **Quality Assurance Manual (QAM):** The Quality Assurance Manual is the company-wide document that describes all aspects of the quality system for PASI. The base QAM template is distributed by the Corporate Quality Department to each of the SQMs/QMs. The local management personnel modify the necessary and permissible sections of the base template and submit those modifications to the Corporate Director of Quality for review. Once approved and signed by both the CEO and the Director of Quality; the SGM/GM/AGM/OM, the SQM/QM, and any Technical Directors sign the Quality Assurance Manual. Each SQM/QM is then in charge of distribution to employees, external customers or regulatory agencies and maintaining a distribution list of controlled document copies. The Quality Assurance Manual template is reviewed on an annual basis by all of the PASI SQMs/QMs and revised accordingly by the Director of Quality.

5.1.7. Standard Operating Procedures (SOPs)

5.1.7.1. SOPs fall into two categories: company-wide documents and facility specific documents. Company-wide SOPs start with the prefix S-ALL- and local SOPs start with the individual facility prefix.

5.1.7.2. The purpose of the company-wide SOPs is to establish policies and procedure that are common and applicable to all PASI facilities. Company-wide SOPs are document-controlled by the corporate quality office and signed copies are distributed to all of the SQMs/QMs. The local management personnel sign the company-wide SOPs. The SQM/QM is then in charge of distribution to employees, external customers, or regulatory agencies and maintaining a distribution list of controlled document copies.

5.1.7.3. Local PASI facilities are responsible for developing facility-specific SOPs applicable to their respective facility. The local facility develops these facility-specific SOPs based on the corporate-wide SOP template. This template is written to incorporate a set of minimum method requirements and PASI best practice requirements. The local facilities may add to or modify the corporate-wide SOP template provided there are no contradictions to the minimum method or best practice requirements. Facility-specific SOPs are controlled by the applicable SQM/QM according to the corporate document management policies.

5.1.7.4. SOPs are reviewed every two years at a minimum although a more frequent review may be required by some state or federal agencies or customers. If no revisions are made based on this review, documentation of the review itself is made by the addition of new signatures on the cover page. If revisions are made, documentation of the revisions is made in the revisions section of each SOP and a new revision number is applied to the SOP. This provides a historical record of all revisions.

5.1.7.5. All copies of superseded SOPs are removed from general use and the original copy of each SOP is archived for audit or knowledge preservation purposes. This ensures that all PASI employees use the most current version of each SOP and provides the SQM/QM with a historical record of each SOP.

5.1.7.6. Additional information can be found in SOP S-MN-Q-273 **Preparation of SOPs** or its equivalent revision or replacement.

5.1.7.7. For Ohio VAP certification, it is required by the Ohio Administrative Code that the laboratory must seek Ohio VAP review and approval of all SOPs and Quality Manual subsequent modifications prior to implementation.

5.1.7.8. For DoD approval, all technical SOPs are reviewed for accuracy and adequacy annually and whenever method procedures change and updated as appropriate. All such reviews are documented and made available for assessment. Non-technical SOPs that are not required elements of the quality system are considered administrative SOPs and are not required to be reviewed annually.

5.2. Document Change Control

5.2.1. Changes to managed documents are reviewed and approved in the same manner as the original review. Any revision to a document requires the approval of the applicable signatories. After revisions are approved, a revision number is assigned and the previous version of the document is officially retired. Copies may be kept for audit or knowledge preservation purposes.

5.2.2. All controlled copies of the previous document are replaced with controlled copies of the revised document and the superseded copies are destroyed or archived. All affected personnel are advised that there has been a revision and any necessary training is scheduled.

5.3. Management of Change

5.3.1. The process for documenting necessary changes within the laboratory network are not typically handled using the corrective or preventive action system as outlined in section 9.0. Management of Change is a proactive approach to dealing with change to minimize the potential negative impact of systematic change in the laboratory and to ensure that each change has a positive desired outcome. This process will primarily be used for the implementation of large scale projects and information system changes as a means to apply consistent systems or procedures within the laboratory network. The request for change is submitted by the initiator and subsequently assigned to an individual or team for development and planning. The final completion of the process culminates in final approval and verification that the procedure was effectively implemented. Additional information can be found in SOP S-MN-Q-257 **Management of Change** or its equivalent revision or replacement.

6.0. EQUIPMENT AND MEASUREMENT TRACEABILITY

Each PASI facility is equipped with sufficient instrumentation and support equipment to perform the relevant analytical testing or field procedures performed by each facility. Support equipment includes chemical standards, thermometers, balances, disposable and mechanical pipettes, etc. This section details some of the procedures necessary to maintain traceability and to perform proper calibration of instrumentation and support equipment. See Attachment III for a list of equipment currently used at the (Minneapolis, Billings, Virginia and Duluth) PASI facility.

6.1. Standards and Traceability

6.1.1. Each PASI facility retains all pertinent information for standards, reagents, and chemicals to assure traceability to a national standard. This includes documentation of purchase, receipt, preparation, and use.

6.1.2. Upon receipt, all purchased standard reference materials are recorded into a standard logbook or database and assigned a unique identification number. The entries include the facility's unique identification number, the chemical name, manufacturer name, manufacturer's identification numbers, receipt date, and expiration date. Vendor's certificates of analysis for all standards, reagents, or chemicals are retained for future reference.

6.1.3. Subsequent preparations of intermediate or working solutions are also documented in a standard logbook or database. These entries include the stock standard name and lot number, the manufacturer name, the solvents used for preparation, the solvent lot number and manufacturer, the preparation steps, preparation date, expiration dates, preparer's initials, and a unique PASI identification number. This number is used in any applicable sample preparation or analysis logbook so the standard can be traced back to the standard preparation record. This process ensures traceability back to the national standard.

6.1.4. All prepared standard or reagent containers include the PASI identification number, the standard or chemical name, the date of preparation, the date of expiration, the concentration with units, and the preparer's initials. This ensures traceability back to the standard preparation logbook or database.

6.1.5. For containers that are too small to accommodate labels that list all of the above information associated with a standard, the minimum required information will be PASI standard ID, concentration, and expiration date. This assures that no standard will be used past its assigned expiration date.

6.1.6. If a second source standard is required to verify an existing calibration or spiking standard, this standard must be obtained from a different manufacturer or from a different lot unless client specific QAPP requirements state otherwise.

6.1.7. Additional information concerning standards and reagent traceability can be found in the SOP S-MN-Q-275 **Standard and Reagent Management and Traceability** or its equivalent revision or replacement.

6.2. General Analytical Instrument Calibration Procedures (Organic and Inorganic)

6.2.1. All support equipment and instrumentation are calibrated or checked before use to ensure proper functioning and verify that the laboratory's requirements are met. All calibrations are performed by, or under the supervision of, an experienced analyst at scheduled intervals against either certified standards traceable to recognized national standards or reference standards whose values have been statistically validated.

6.2.2. Calibration standards for each parameter are chosen to establish the linear range of the instrument and must bracket the concentrations of those parameters measured in the samples. The lowest calibration standard is the lowest concentration for which quantitative data may be reported. Data reported below this level is considered to have less certainty and must be reported using appropriate data qualifiers or explained in a narrative. The highest calibration standard is the highest concentration for which quantitative data may be reported. Data reported above this level is considered to have less certainty and must be reported using appropriate data qualifiers or explained in the narrative. Any specific method requirement for number and type of calibration standards supersedes the general requirement. Instrument and method specific calibration criteria are explained within the specific analytical standard operating procedures for each facility.

- For Ohio VAP projects, samples must be reanalyzed to obtain results within the linear range unless there is insufficient sample volume for reanalysis

6.2.3. Results from all calibration standards analyzed must be included in constructing the calibration curve with the following exceptions:

6.2.3.1. The lowest level calibration standard may be removed from the calibration as long as the remaining number of concentration levels meets the minimum established by the method and standard operating procedure. For multi-parameter methods, this may be done on an individual analyte basis. The reporting limit must be adjusted to the lowest concentration included in the calibration curve;

6.2.3.2. The highest level calibration standard may be removed from the calibration as long as the remaining number of concentration levels meets the minimum established by the method and standard operating procedure. For multi-parameter methods, this may be done an individual analyte basis. The upper limit of quantitation must be adjusted to the highest concentration included in the calibration curve;

6.2.3.3. Multiple points from either the high end or the low end of the calibration curve may be excluded as long as the remaining points are contiguous in nature and the minimum number of levels remains as established by method or standard operating procedure. The reporting limit or quantitation range, whichever is appropriate, must be adjusted accordingly;

6.2.3.4. Results from a concentration level between the lowest and highest calibration levels can only be excluded from an initial calibration curve for a documentable and acceptable cause with approval from the responsible department supervisor and the local SQM/QM or their designee. An acceptable cause is defined as an obvious sample introduction issue that resulted in no response, documentation of an incorrectly prepared standard, or a documented response of a single standard that is greater than 2X the difference from the expected value of that standard. The results for all analytes are to be excluded and the point must be replaced by re-analysis. Re-analysis of this interior standard must occur within the same 12-hour tune time period for GC/MS methodologies and within 8 hours of the initial analysis of that standard for non-GC/MS methodologies. All samples analyzed prior to the re-analyzed calibration curve point must be re-analyzed after the calibration curve is completed and re-processed against the final calibration curve.

6.2.4. Instrumentation or support equipment that cannot be calibrated to specification or is otherwise defective is clearly labeled as out-of-service until it has been repaired and tested to demonstrate it meets the laboratory's specifications. All repair and maintenance activities including service calls are documented in the maintenance log. Equipment sent off-site for calibration testing is packed and transported to prevent breakage and is in accordance with the calibration laboratory's recommendations.

6.2.5. In the event that recalibration of a piece of test equipment indicates the equipment may have been malfunctioning during the course of sample analysis, an investigation is performed. The results of the investigation along with a summary of the information reviewed are documented and maintained by the quality manager. Customers must be notified within 30 days after the data investigation is completed and the impact to final results is assessed. This allows for sufficient investigation and review of documentation to determine the impact on the analytical results. Instrumentation found to be consistently out of calibration is either repaired and positively verified or taken out of service and replaced.

6.2.6. Raw data records are retained to document equipment performance. Sufficient raw data is retained to reconstruct the instrument calibration and explicitly connect the continuing calibration verification to the initial calibration.

6.2.7. **General Organic Calibration Procedures**

6.2.7.1. Calibration standards are prepared at a minimum of five concentrations for organic analyses (unless otherwise stipulated in the method).

6.2.7.2. Initial calibration curves are evaluated against appropriate statistical models as required by the analytical methods. Curves that do not meet the appropriate criteria require corrective action that may include re-running the initial calibration curve. Rounding to meet initial calibration criteria is not allowed, that is, 15.3 cannot be rounded down to meet a $\leq$ 15% RSD requirement. This also applies to linear and non-linear fit requirements. All initial calibrations are verified with an initial calibration verification standard (ICV) obtained from a second manufacturer or second lot from the same manufacturer if that lot can be demonstrated as prepared independently from other lots prior to the analysis of samples. Sample results are quantitated from the initial calibration unless otherwise required by regulation, method, or program.

6.2.7.3. The calibration curve is periodically verified by the analysis of a mid-level continuing calibration verification (CCV) standard during the course of sample analysis. This standard is from the same source as the initial calibration unless otherwise specified in the source method to be from an alternate source material. Rounding to meet continuing calibration criteria is not allowed. Continuing calibration verification is performed at the beginning and end of each analytical batch except if an internal standard is used, then only one verification at the beginning of the batch is needed, whenever it is expected that the analytical system may be out of calibration, if the time period for calibration has expired, or for analytical systems that have specific calibration verification requirements. This verification standard must meet acceptance criteria in order for sample analysis to proceed.

6.2.7.4. In the event that the CCV does not meet the acceptance criteria, a second CCV may be injected as part of the diagnostic evaluation and corrective action investigation. If the second CCV is acceptable, the analytical sequence may be continued. If both CCVs fail, the analytical sequence is terminated and corrective action is initiated. Sample analysis cannot begin until after documented corrective action has been completed and either two consecutive passing CCVs have been analyzed or the instrument has successfully passed a new initial calibration. All samples analyzed since the last compliant CCV are re-analyzed for methodologies utilizing external calibration.

6.2.7.4.1. For DoD labs: the lab must re-analyze CCVs and all samples analyzed since the last successful calibration verification. If re-analysis is not possible, the lab must notify the client prior to reporting data associated with a non-compliant CCV. If these data are reported, the data must be qualified and explained in the case narrative. If the lab routinely analyzes two CCVs, then both CCVs must be evaluated. If either CCV fails, the lab must perform all required corrective actions and re-analyze all samples since the last acceptable calibration verification.

6.2.7.5. When instruments are operating unattended, autosamplers may be programmed to inject consecutive CCVs as a preventative measure against CCV failure with no corrective action. In this case, both CCVs must be evaluated to determine potential impact to the results. A summary of the decision tree and necessary documentation are listed below:

- If both CCVs meet the acceptance criteria, the analytical sequence is allowed to continue without corrective action. The 12 hour clock begins with the injection of the second CCV.
- If the first CCV does not meet the acceptance criteria and the second CCV is acceptable, the analytical sequence is continued and the results are reported.
- If the first CCV meets the acceptance criteria and the second CCV is out of control, the samples after the out of control CCV must be re-analyzed in a compliant analytical sequence.
- If both CCVs are out of control, all samples since the last acceptable CCV must be re-analyzed in a compliant analytical sequence.

6.2.7.6. Some analytical methods require that samples be bracketed by passing CCVs analyzed both before and after the samples. This is specific to each method but, as a general rule, all external calibration methods require bracketing CCVs. Most internal standard calibrations do not require bracketing CCVs.

6.2.7.7. Some analytical methods require verification based on a time interval; some methods require a frequency based on an injection interval. The type and frequency of the calibration verifications is dependent on both the analytical method and possibly on the quality program associated with the samples. The type and frequency of calibration verification will be documented in the method specific SOP employed by each laboratory.

6.2.8. General Inorganic Calibration Procedures

6.2.8.1. The instrument is initially calibrated with standards at multiple concentrations to establish the linearity of the instrument's response. A calibration blank is also included. Initial calibration curves are evaluated against appropriate statistical models as required by the analytical methods. Rounding to meet initial calibration criteria is not allowed. This also applies to linear and non-linear fit requirements. The number of calibration standards used depends on the specific method criteria or customer project requirements, although normally a minimum of three standards is used.

6.2.8.2. The ICP and ICP/MS can be standardized with a zero point and a single point calibration if:

- Prior to analysis, the zero point and the single point calibration are analyzed and a linear range has been established,
- Zero point and single point calibration standards are analyzed with each batch
- A standard corresponding to the LOQ is analyzed with the batch and meets the established acceptance criteria
- The linearity is verified at the frequency established by the method or manufacturer.

6.2.8.3. All initial calibrations are verified with an initial calibration verification standard (ICV) obtained from a second manufacturer or second lot from the same manufacturer if the lot can be demonstrated as prepared independently from other lots prior to the analysis of samples. Sample results are quantitated from the initial calibration unless otherwise required by regulation, method, or program.

6.2.8.4. During the course of analysis, the calibration curve is periodically verified by the analysis of calibration verification standards (CCV). A calibration verification standard is analyzed within each analytical batch at method/program specific intervals to verify that the initial calibration is still valid. The CCV is also analyzed at the end of the analytical batch.

6.2.8.5. A calibration blank is also run with each calibration verification standard to verify the cleanliness of the system. All reported results must be bracketed by acceptable CCVs. Instrument and method specific calibration acceptance criteria are explained within the specific analytical standard operating procedures for each facility.

6.2.8.6. Interference check standards are also analyzed per method requirements and must meet acceptance criteria for metals analyses.

6.3. Support Equipment Calibration Procedures

6.3.1. All support equipment is calibrated or verified at least annually using NIST traceable references over the entire range of use. The results of calibrations or verifications must be within the specifications required or the equipment will be removed from service until repaired. The laboratory maintains records to demonstrate the correction factors applied to working thermometers.

6.3.2. On each day the equipment is used, balances, ovens, refrigerators (those used to keep samples and standards at required temperatures), freezers, and water baths are checked in the expected use range with NIST traceable references in order to ensure the equipment meets laboratory specifications and these checks are documented appropriately.

6.3.3. **Analytical Balances**

6.3.3.1. Each analytical balance is calibrated or verified at least annually by a qualified service technician. The calibration of each balance is verified each day of use with weights traceable to NIST bracketing the range of use. Calibration weights are ASTM Class 1 or other class weights that have been calibrated against a NIST standard weight and are re-certified every 5 years at a minimum against a NIST traceable reference. Some accrediting agencies may require more frequent checks. If balances are calibrated by an external agency, verification of their weights must be provided. All information pertaining to balance maintenance and calibration is recorded in the individual balance logbook and/or is maintained on file in the Quality department.

6.3.4. **Thermometers**

6.3.4.1. Certified, or reference, thermometers are maintained for checking calibration of working thermometers. Reference thermometers are provided with NIST traceability for initial calibration and are re-certified, at a minimum, every 3 years with equipment directly traceable to NIST.

6.3.4.2. Working thermometers are compared with the reference thermometers annually according to corporate metrology procedures. Each thermometer is individually numbered and assigned a correction factor based on the NIST reference source. In addition, working thermometers are visually inspected by laboratory personnel prior to use and temperatures are documented.

6.3.4.3. Laboratory thermometer inventory and calibration data are maintained in the Quality department.

6.3.5. **pH/Electrometers**

6.3.5.1. The meter is calibrated before use each day, using fresh buffer solutions. See the analytical method SOP for more specific information.

6.3.6. **Spectrophotometers**

6.3.6.1. During use, spectrophotometer performance is checked at established frequencies in analysis sequences against initial calibration verification (ICV) and continuing calibration verification (CCV) standards.

6.3.7. **Mechanical Volumetric Dispensing Devices**

6.3.7.1. Mechanical volumetric dispensing devices including bottle top dispensers (those that are critical in measuring a required amount of reagent), pipettes, and burettes, excluding Class A volumetric glassware, are checked for accuracy on a quarterly basis.

6.3.7.2. Additional information regarding calibration and maintenance of laboratory support equipment can be found in SOP S-MN-Q-264 **Support Equipment** or its equivalent revision or replacement.

6.4. Instrument/Equipment Maintenance

6.4.1. The objectives of the Pace Analytical maintenance program are twofold: to establish a system of instrument care that maintains instrumentation and equipment at required levels of calibration and sensitivity, and to minimize loss of productivity due to repairs.

6.4.2. The Operations Manager and/or department manager/supervisors are responsible for providing technical leadership to evaluate new equipment, solve equipment problems, and coordinate instrument repair and maintenance. Analysts have the primary responsibility to perform routine maintenance.

6.4.3. To minimize downtime and interruption of analytical work, preventative maintenance is routinely performed on each analytical instrument. Up-to-date instructions on the use and maintenance of equipment are available to staff in the department where the equipment is used.

6.4.4. Department manager/supervisors are responsible for maintaining an adequate inventory of spare parts required to minimize equipment downtime. This inventory includes parts and supplies that are subject to frequent failure, have limited lifetimes, or cannot be obtained in a timely manner should a failure occur.

6.4.5. All major equipment and instrumentation items are uniquely identified to allow for traceability. Equipment/instrumentation is, unless otherwise stated, identified as a system and not as individual pieces. The laboratory maintains equipment records that include the following:

- The name of the equipment and its software
- The manufacturer’s name, type, and serial number
- Approximate date received and date placed into service
- Current location in the laboratory
- Condition when received (new, used, etc.)
- Copy of any manufacturer’s manuals or instructions
- Dates and results of calibrations and next scheduled calibration (if known)
- Details of past maintenance activities, both routine and non-routine
- Details of any damage, modification or major repairs

6.4.6. All instrument maintenance is documented in maintenance logbooks that are assigned to each particular instrument or system.

6.4.7. The maintenance log entry must include a summary of the results of that analysis and verification by the analyst that the instrument has been returned to an in-control status. In addition, each entry must include the initials of the analyst making the entry, the dates the maintenance actions were performed, and the date the entry was made in the maintenance logbook, if different from the date(s) of the maintenance.

6.4.8. Any equipment that has been subjected to overloading or mishandling, or that gives suspect results, or has been shown to be defective, is taken out of service and clearly identified. The equipment shall not be used to analyze customer samples until it has been repaired and shown to perform satisfactorily. In the event of instrumentation failure, to avoid hold time issues, the lab may subcontract the necessary samples to another Pace lab or to an outside subcontract lab if possible.

7.0. CONTROL OF DATA

Analytical results processing, verification, and reporting are procedures employed that result in the delivery of defensible data. These processes include, but are not limited to, calculation of raw data into final concentration values, review of results for accuracy, evaluation of quality control criteria and assembly of technical reports for delivery to the data user.

All analytical data undergo a well-defined, well-documented multi-tier review process prior to being reported to the customer. This section describes procedures used by PASI for translating raw analytical data into accurate final sample reports as well as PASI data storage policies.

7.1. Analytical Results Processing

7.1.1. When analytical, field, or product testing data is generated, it is either recorded in a bound laboratory logbook (e.g., Run log or Instrument log) or copies of computer-generated printouts that are appropriately labeled and filed. These logbooks and other laboratory records are kept in accordance with each facility's Standard Operating Procedure for documentation storage and archival. If the laboratory chooses to minimize or eliminate its paper usage, these records can be kept on electronic media. In this case, the laboratory must ensure that there are sufficient redundant electronic copies so no data is lost due to unforeseen computer issues.

7.1.2. The primary analyst is responsible for initial data reduction and review. This includes confirming compliance with required methodology, verifying calculations, evaluating quality control data, noting non-conformances in logbooks or as footnotes or narratives, and uploading analytical results into the LIMS. The primary analyst must be clearly identified in all applicable logbooks, spreadsheets and LIMS fields.

7.1.3. The primary analyst then compiles the initial data package for verification. This compilation must include sufficient documentation for data review. It may include standard calibrations, chromatograms, manual integration documentation, electronic printouts, chain of custody forms, and logbook copies.

7.1.4. Some agencies or customers require different levels of data reporting. For these special levels, the primary analyst may need to compile additional project information, such as initial calibration data or extensive spectral data, before the data package proceeds to the verification step.

7.2. Data Verification

7.2.1. Data verification is the process of examining data and accepting or rejecting it based on pre-defined criteria. This review step is designed to ensure that reported data are free from calculation and transcription errors, that quality control parameters are evaluated, and that any non-conformances are properly documented.

7.2.2. Analysts performing the analysis and subsequent data reduction have primary responsibility for quality of the data produced. The primary analyst initiates the data verification process by reviewing and accepting the data, provided QC criteria have been met for the samples being reported. Data review checklists, either hardcopy or electronic, are used to document the data review process. The primary analyst is responsible for the initial input of the data into the LIMS. The primary analyst and reviewer must be clearly identified on all applicable data review checklists.

7.2.3. The completed data package is then sent to a designated qualified reviewer (this cannot be the primary analyst). The following criteria have been established to qualify someone as a data reviewer. To perform secondary data review, the reviewer must:

7.2.3.1. Have a current Demonstration of Capability (DOC) study on file and have an SOP acknowledgement form on file for the method/procedure being reviewed; or, [See Note]

7.2.3.2. Have a DOC on file for a similar method/technology (i.e., GC/MS) and have an SOP acknowledgment form on file for the method/procedure being reviewed; or, [See Note]

7.2.3.3. Supervise or manage a Department and have an SOP acknowledgment form on file for the method/procedure being reviewed; or,

7.2.3.4. Have significant background in the department/methods being reviewed through education or experience and have an SOP acknowledgment form on file for the method/procedure being reviewed.

7.2.4. **Note:** Secondary reviewer status must be approved personally by the SQM/QM or SGM/GM/AGM/OM in the event that this person has no prior experience on the specific method or general technology.

7.2.5. This reviewer provides an independent technical assessment of the data package and technical review for accuracy according to methods employed and laboratory protocols. This assessment involves a quality control review for use of the proper methodology and detection limits, compliance to quality control protocol and criteria, presence and completeness of required deliverables, and accuracy of calculations and data quantitation. The reviewer validates the data entered into the LIMS and documents approval of manual integrations.

7.2.6. Once the data have been technically reviewed and approved, authorization for release of the data from the analytical section is indicated by initialing and dating the data review checklist or otherwise initialing and dating the data (or designating the review of data electronically). The Operations or Project Manager examines the report for method appropriateness, detection limits and QC acceptability. Any deviations from the referenced methods are checked for documentation and validity, and QC corrective actions are reviewed for successful resolution. Alternately, final reports can be set to auto email to the client after the analytical results are final and have been run through the Data Checker program for errors. These are set up on a case-by-case basis.

7.2.7. Additional information regarding data review procedures can be found in SOP S-MN-L-132 **Data Review** or its equivalent revision or replacement, as well as in SOP S-MN-Q-214 **Manual Integration** or its equivalent revision or replacement.

7.2.8. The Data Checker program will process validated data for a given project against a set of pre-determined requirements and known chemistry relationships. The program creates a report that includes a series of warnings and errors for any requirement or condition determined to be suspect or incorrect. These warnings and error counts are displayed on the "Project Inquiry by Client" screen and on the final Data Checker reports. For projects that have any number of warnings or errors, the Data Checker report will provide a message that identifies the source and condition of the error or warning.

7.2.9. Some reports and/or data packages may be reviewed by the QM or SQM or designee based on program requirements (e.g., DoD) or client requirements. In this case a thorough review for completeness and accuracy may include a compilation of raw data and QC summaries in addition to the final report to produce a full deliverable package. In the case of DoD, 100% of all packages must have a final administrative review (to confirm that primary and secondary reviews were completed and documented and that data packages are complete) and 10% of all data packages must be reviewed by the

Quality Manager for technical completeness/accuracy. This 10% review can be done after the data packages have been submitted to the clients. See SOP S-MN-Q-271 (or equivalent replacement), **Audits and Inspections**, for full Quality department final report and raw data review requirements.

7.3. Data Reporting

7.3.1. Data for each analytical fraction pertaining to a particular PASI project number are delivered to the Project Manager for assembly into the final report. All points mentioned during technical and QC reviews are included in data qualifiers on the final report or in a separate case narrative if there is potential for data to be impacted.

7.3.2. Final reports are prepared according to the level of reporting required by the customer and can be transmitted to the customer via hardcopy or electronic deliverable. A standard PASI final report consists of the following components:

7.3.2.1. A title which designates the report as “Final Report”, “Laboratory Results”, “Certificate of Results”, etc.;

7.3.2.2. Name and address of laboratory (or subcontracted laboratories, if used);

7.3.2.3. Phone number and name of laboratory contact to where questions can be referred;

7.3.2.4. A unique identification number for the report. The pages of the report shall be numbered and a total number of pages shall be indicated;

7.3.2.5. Name and address of customer and name of project;

7.3.2.6. Unique identification of samples analyzed as well as customer sample IDs;

7.3.2.7. Identification of any sample that did not meet acceptable sampling requirements of the relevant governing agency, such as improper sample containers, holding times missed, sample temperature, etc.;

7.3.2.8. Date and time of collection of samples, date of sample receipt by the laboratory, dates of sample preparation and analysis, and times of sample preparation and analysis when the holding time for either is 72 hours or less;

7.3.2.9. Identification of the test methods used;

7.3.2.10. Identification of sampling procedures if sampling was conducted by the laboratory;

7.3.2.11. Deviations from, additions to, or exclusions from the test methods. These can include failed quality control parameters, deviations caused by the matrix of the sample, etc., and can be shown as a case narrative or as defined footnotes to the analytical data;

7.3.2.12. Identification of whether calculations were performed on a dry or wet-weight basis;

7.3.2.13. Reporting limits used;

7.3.2.14. Final results or measurements, supported by appropriate chromatograms, charts, tables, spectra, etc.;

7.3.2.15. A signature and title, electronic or otherwise, of person accepting responsibility for the content of the report;

7.3.2.16. Date report was issued;

7.3.2.17. A statement clarifying that the results of the report relate only to the samples tested or to the samples as they were received by the laboratory;

7.3.2.18. If necessary, a statement indicating that the report must not be reproduced except in full, without the written approval of the laboratory;

7.3.2.19. Identification of all test results provided by a subcontracted laboratory or other outside source;

7.3.2.20. Identification of results obtained outside of quantitation levels.

In addition to the requirements listed above, final reports shall also contain the following items when necessary for the interpretation of results:

7.3.2.21. Deviations from, additions to, or exclusions from the test method, and information on specific test conditions, such as environmental conditions;

7.3.2.22. Where relevant, a statement of compliance/non-compliance with requirements and/or specifications (e.g., the TNI standard);

7.3.2.23. Where applicable, a statement on the estimated uncertainty of measurement; information on uncertainty is needed in test reports when it is relevant to the validity or application of the test results, when a customer's instruction so requires, or when the uncertainty affects compliance to a specification limit;

7.3.2.24. Where appropriate and needed, opinions and interpretations, which may include opinions on the compliance/non-compliance of the results with requirements, fulfillment of contractual requirements, recommendations on how to use the results, and guidance to be used for improvement;

7.3.3. Additional items may be required per Client QAPPs or different state regulations. Ohio VAP requires an Affidavit that must summarize if there are any exceptions to what has been reported, this includes, but is not limited to, itemizing any analytes that the laboratory is not approved for under the VAP program. Any analytes reported that are not part of a scope of accreditation or approval program must be clearly indicated on the final report and associated paperwork such as an Affidavit.

7.3.4. For DoD labs, in reference to item 7.3.2.8 listed above, both date and time of preparation and analysis are considered essential information, regardless of the length of the holding time, and shall be included as part of the laboratory report.

7.3.5. Any changes made to a final report shall be designated as "Revised" or equivalent wording. The laboratory must keep sufficient archived records of all laboratory reports and revisions. For higher levels of data deliverables, a copy of all supporting raw data is sent to the customer along with a final report of results. When possible, the PASI facility will provide electronic data deliverables (EDD) as required by contracts or upon customer request.

7.3.6. Customer data that requires transmission by telephone, telex, facsimile or other electronic means undergoes appropriate steps to preserve confidentiality.

7.3.7. The following positions are the only approved signatories for PASI final reports:

- Senior General Manager
- General Manager
- Assistant General Manager
- Senior Quality Manager
- Quality Manager

- Client Services Manager
- Project Manager
- Project Coordinator

7.4. Data Security

7.4.1. All data including electronic files, logbooks, extraction/digestion/distillation worksheets, calculations, project files and reports, and any other information used to produce the technical report are maintained secured and retrievable by the PASI facility.

7.5. Data Archiving

7.5.1. All records compiled by PASI are maintained legible and retrievable and stored secured in a suitable environment to prevent loss, damage, or deterioration by fire, flood, vermin, theft, and/or environmental deterioration. Records are retained for a minimum of five years unless superseded by federal, state, contractual, and/or accreditation requirements. These records may include, but are not limited to, customer data reports, calibration and maintenance of equipment, raw data from instrumentation, quality control documents, observations, calculations, and logbooks. These records are retained in order to provide for possible historical reconstruction including sampling, receipt, preparation, analysis, and personnel involved. TNI-related records will be made readily available to accrediting authorities. Access to archived data is documented and controlled by the SQM/QM or a designated Data Archivist.

7.5.2. Records that are computer generated have either a hard copy or electronic write protected backup copy. Hardware and software necessary for the retrieval of electronic data is maintained with the applicable records. Archived electronic records are stored protected against electronic and/or magnetic sources.

7.5.3. In the event of a change in ownership, accountability or liability, reports of analyses performed pertaining to accreditation will be maintained by the acquiring entity for a minimum of five years. In the event of bankruptcy, laboratory reports and/or records will be transferred to the customer and/or the appropriate regulatory entity upon request.

7.6. Data Disposal

7.6.1. Data that has been archived for the facility's required storage time may be disposed of in a secure manner by shredding, returning to customer, or utilizing some other means that does not jeopardize data confidentiality. Records of data disposal will be archived for a minimum of five years unless superseded by federal, contractual, and/or accreditation requirements. Data disposal includes any preliminary or final reports that are disposed.

7.6.2. For Ohio VAP labs, all documents and data prepared or acquired in connection to VAP work must be retained for a period of 10 years after the data of reporting. After 10 years, if the laboratory wishes to dispose of the records, the laboratory must notify the VAP agency by certified mail of such intent and provide the agency an opportunity to request the materials from Pace. The documents must not be disposed of until notification has been received in response to the Pace request for disposal.

8.0. QUALITY SYSTEM AUDITS AND REVIEWS

8.1. Internal Audits

8.1.1. Responsibilities

8.1.1.1. The SQM/QM is responsible for designing and/or conducting internal audits in accordance with a predetermined schedule and procedure. Since internal audits represent an independent assessment of laboratory functions, the auditor must be functionally independent from laboratory operations to ensure objectivity. The auditor must be trained, qualified, and familiar enough with the objectives, principles, and procedures of laboratory operations to be able to perform a thorough and effective evaluation. The SQM/QM evaluates audit observations and verifies the completion of corrective actions. In addition, a periodic corporate audit will be conducted. The corporate audits will focus on the effectiveness of the Quality System as outlined in this manual but may also include other quality programs applicable to an individual laboratory.

8.1.2. Scope and Frequency of Internal Audits

8.1.2.1. The complete internal audit process consists of the following four sections:

- Raw Data Review audits- conducted according to a schedule per local SQM/QM. A certain number of these data review audits are conducted per quarter to accomplish this yearly schedule;
- Quality System audits- considered the traditional internal audit function and includes analyst interviews to help determine whether practice matches method requirements and SOP language;
- Final Report reviews;
- Corrective Action Effectiveness Follow-up.

8.1.2.2. Internal systems audits are conducted yearly at a minimum. The scope of these audits includes evaluation of specific analytical departments or a specific quality related system as applied throughout the laboratory.

8.1.2.3. Where the identification of non-conformities or departures cast doubt on the laboratory's compliance with its own policies and procedures, the lab must ensure that the appropriate areas of activity are audited as soon as possible. Examples of system-wide elements that can be audited include:

- Quality Systems documents, such as Standard Operating Procedures, training documents, Quality Assurance Manual, and all applicable addenda
- Data records and non-technical documents
- Personnel and training files.
- General laboratory safety protocols.
- Chemical handling practices, such as labeling of reagents, solutions, and standards as well as all associated documentation.
- Documentation concerning equipment and instrumentation, calibration/maintenance records, operating manuals.
- Sample receipt and management practices.
- Analytical documentation, including any discrepancies and corrective actions.

- General procedures for data security, review, documentation, reporting, and archiving.
- Data integrity issues such as proper manual integrations.

8.1.2.4. When the operations of a specific department are evaluated, a number of additional functions are reviewed including:

- Detection limit studies
- Internal chain of custody documentation
- Documentation of standard preparations
- Quality Control limits and Control charts

8.1.2.5. Certain projects may require an internal audit to ensure laboratory conformance to site work plans, sampling and analysis plans, QAPPs, etc.

8.1.2.6. A representative number of data audits are completed annually. Findings from these data audits are handled in the same manner as those from other internal and external audits.

8.1.2.7. The laboratory, as part of their overall internal audit program, ensures that a review is conducted with respect to any evidence of inappropriate actions or vulnerabilities related to data integrity. Discovery and reporting of potential data integrity issues are handled in a confidential manner. All investigations that result in findings of inappropriate activity are fully documented, including the source of the problem, the samples and customers affected the impact on the data, the corrective actions taken by the laboratory, and which final reports had to be re-issued. Customers must be notified within 30 days after the data investigation is completed and the impact to final results is assessed.

8.1.3. Internal Audit Reports and Corrective Action Plans

8.1.3.1. Additional information can be found in SOP S-MN-Q-271 **Internal and External Audits** or its equivalent revision or replacement.

8.1.3.2. A full description of the audit, including the identification of the operation audited, the date(s) on which the audit was conducted, the specific systems examined, and the observations noted are summarized in an internal audit report. Although other personnel may assist with the performance of the audit, the SQM/QM writes and issues the internal audit report identifying which audit observations are deficiencies that require corrective action.

8.1.3.3. When audit findings cast doubt on the effectiveness of the operations or on the correctness of validity of the laboratory's environmental test results, the laboratory will take timely corrective action and notify the customer in writing within three business days, if investigations show that the laboratory results may have been affected.

8.1.3.4. Once completed, the internal audit report is issued jointly to the SGM/GM/AGM/OM and the manager(s)/supervisor(s) of the audited operation at a minimum. The responsible manager(s)/supervisor(s) responds within 14 days with a proposed plan to correct all of the deficiencies cited in the audit report. The SQM/QM may grant additional time for responses to large or complex deficiencies (not to exceed 30 days). Each response must include timetables for completion of all proposed corrective actions.

8.1.3.5. The SQM/QM reviews the audit responses. If the response is accepted, the SQM/QM uses the action plan and timetable as a guideline for verifying completion of the corrective action(s). If the SQM/QM determines that the audit response does not adequately address the correction of cited deficiencies, the response will be returned for modification.

8.1.3.6. To complete the audit process, the SQM/QM performs a re-examination of the areas where deficiencies were found to verify that all proposed corrective actions have been implemented. An audit deficiency is considered closed once implementation of the necessary corrective action has been audited and verified. This is usually within 60-90 days after implementation. If corrective action cannot be verified, the associated deficiency remains open until that action is completed.

8.2. External Audits

8.2.1. PASI laboratories are audited regularly by regulatory agencies to maintain laboratory certifications and by customers to maintain appropriate specific protocols.

8.2.2. Audit teams external to the company review the laboratory to assess the effectiveness of systems and degree of technical expertise. The SQM/QM and other QA staff host the audit team and assist in facilitation of the audit process. Generally, the auditors will prepare a formalized audit report listing deficiencies observed and follow-up requirements for the laboratory. In some cases, items of concern are discussed during a debriefing convened at the end of the on-site review process.

8.2.3. The laboratory staff and supervisors develop corrective action plans to address any deficiencies with the guidance of the SQM/QM. The SGM/GM/AGM/OM provides the necessary resources for staff to develop and implement the corrective action plans. The SQM/QM collates this information and provides a written response to the audit team. The response contains the corrective action plan and expected completion dates for each element of the plan. The SQM/QM follows-up with the laboratory staff to ensure corrective actions are implemented and that the corrective action was effective.

8.3. Quarterly Quality Reports

8.3.1. The SQM/QM is responsible for preparing a quarterly report to management summarizing the effectiveness of the laboratory Quality Systems. This status report will include:

- Overview of quality activities for the quarter
- Certification status
- Proficiency Testing study results
- SOP revision activities
- Internal audit (method/system) findings
- Manual integration audit findings (Mintminer)
- Raw Data and Final Report review findings
- MDL activities
- Other significant Quality System items

8.3.2. The Corporate Director of Quality utilizes the information from each laboratory to make decisions impacting the quality program compliance of the company as a whole. Each SGM/GM/AGM/OM utilizes the quarterly report information to make decisions impacting Quality Systems and operational systems at a local level.

8.3.3. Additional information can be found in SOP S-ALL-Q-014 **Quality System Review** or its equivalent revision or replacement.

8.4. Annual Managerial Review

8.4.1. A managerial review of Management and Quality Systems is performed on an annual basis at a minimum. This allows for assessing program effectiveness and introducing changes and/or improvements.

8.4.2. The managerial review must include the following topics of discussion:

- Suitability of quality management policies and procedures
- Manager/Supervisor reports
- Internal audit results
- Corrective and preventive actions
- External assessment results
- Proficiency testing studies
- Sample capacity and scope of work changes
- Customer feedback, including complaints
- Recommendations for improvement,
- Other relevant factors, such as quality control activities, resources, and staffing.

8.4.3. This managerial review must be documented for future reference by the SQM/QM and copies of the report are distributed to laboratory staff. Results must feed into the laboratory planning system and must include goals, objectives, and action plans for the coming year. The laboratory shall ensure that any actions identified during the review are carried out within an appropriate and agreed upon timescale.

8.5. Customer Service Reviews

8.5.1. As part of the annual managerial review listed previously, the sales staff is responsible for reporting on customer feedback, including complaints. The acquisition of this information is completed by performing surveys.

8.5.2. The sales staff continually receives customer feedback, both positive and negative, and reports this feedback to the laboratory management in order for them to evaluate and improve their management system, testing activities and customer service.

8.5.3. In addition, the labs must be willing to cooperate with customers or their representatives to clarify customer requests and to monitor the laboratory's performance in relation to the work being performed for the customers. This cooperation may include providing the customer reasonable access to relevant areas of the lab for the witnessing of tests being performed; or the preparation of samples or data deliverables to be used for verification purposes.

8.5.4. Customer service is an important aspect to Pace's overall objective of providing a quality product. Good communication should be provided to the customer's throughout projects. The lab should inform the customer of any delay or major deviations in the performance of analytical tests.

9.0. CORRECTIVE ACTION

Additional information can be found in SOP S-MN-Q-262 **Corrective and Preventive Actions** or its equivalent revision or replacement.

During the process of sample handling, preparation, and analysis, or during review of quality control records, or during reviews of non-technical portions of the lab, certain occurrences may warrant the necessity of corrective actions. These occurrences may take the form of analyst errors, deficiencies in quality control, method deviations, or other unusual circumstances. The Quality System of PASI provides systematic procedures for the documentation, monitoring, completion of corrective actions, and follow-up verification of the effectiveness of these corrective actions. This can be done using PASI's LabTrack system or other system that lists among at a minimum, the deficiency by issue number, the deficiency source, responsible party, root cause, resolution, due date, and date resolved.

9.1. Corrective Action Documentation

9.1.1. The following items are examples of sources of laboratory deviations or non-conformances that warrant some form of documented corrective action:

- Internal Laboratory Non-Conformance Trends
- PE/PT Sample Results
- Internal and External Audits
- Data or Records Review (including non-technical records)
- Client Complaints
- Client Inquiries
- Holding Time violations

9.1.2. Documentation of corrective actions may be in the form of a comment or footnote on the final report that explains the deficiency (e.g., matrix spike recoveries outside of acceptance criteria) or it may be a more formal documentation (either paper system or computerized spreadsheet). This depends on the extent of the deficiency, the impact on the data, and the method or customer requirements for documentation.

9.1.3. The person who discovers the deficiency or non-conformance initiates the corrective action documentation on the Non-Conformance Corrective/ Preventive Action report and/or LabTrack. The documentation must include the affected projects and sample numbers, the name of the applicable Project Manager, the customer name, and the sample matrix involved. The person initiating the corrective action documentation must also list the known causes of the deficiency or non-conformance as well as any corrective/preventative actions that they have taken. Preventive actions must be taken in order to prevent or minimize the occurrence of the situation.

9.1.4. In the event that the laboratory is unable to determine the cause, laboratory personnel and management staff will start a root cause analysis by going through an investigative process. During this process, the following general steps must be taken into account: defining the non-conformance, assigning responsibilities, determining if the condition is significant, and investigating the root cause of the nonconformance. General non-conformance investigative techniques follow the path of the sample through the process looking at each individual step in detail. The root cause must be documented within LabTrack or on the Corrective/Preventive Action Report.

9.1.5. After all the documentation is completed, the routing of the Corrective/Preventive Action Report and /or LabTrack will continue from the person initiating the corrective action, to their immediate supervisor or the applicable Project Manager and finally to the SQM/QM, if applicable, who may be responsible for final review and signoff of corrective/preventive actions.

9.1.6. In the event that analytical testing or results do not conform to documented laboratory policies or procedures, customer requirements, or standard specifications, the laboratory shall investigate the significance of the non-conformance and document appropriate corrective actions. The proper level of laboratory management will review any departure from these requirements for technical suitability. These departures are permitted only with the approval of the SGM/GM/AGM/OM or the SQM/QM. Where necessary, Project Management will notify the customer of the situation and will advise of any ramifications to data quality (with the possibility of work being recalled). The procedures for handling non-conforming work are detailed in SOP S-MN-Q-262 **Corrective and Preventive Actions** or its equivalent revision or replacement.

9.2. Corrective Action Completion

9.2.1. Internal Laboratory Non-Conformance Trends

9.2.1.1. There are several types of non-conformance trends that may occur in the laboratory that would require the initiation of a corrective action report. Laboratories may choose to initiate a corrective action for all instances of one or more of these categories if they so choose, however the intent is that each of these would be handled according to its severity; one time instances could be handled with a footnote or qualifier whereas a systemic problem with any of these categories may require an official corrective action process. These categories, as defined in the Corrective Action SOP are as follows:

- Login error
- Preparation Error
- Contamination
- Calibration Failure
- Internal Standard Failure
- LCS Failure
- Laboratory accident
- Spike Failure
- Instrument Failure
- Final Reporting error

9.2.2. PE/PT Sample Results

9.2.2.1. Any PT result assessed as “not acceptable” requires an investigation and applicable corrective actions. The operational staff is made aware of the PT failures and they are responsible for reviewing the applicable raw data and calibrations and list possible causes for error. The SQM/QM reviews their findings and initiates another external PT sample or an internal PT sample to try and correct the previous failure. Replacement PT results must be monitored by the SQM/QM and reported to the applicable regulatory authorities.

9.2.3. Internal and External Audits

9.2.3.1. The SQM/QM is responsible for documenting all audit findings and their corrective actions. This documentation must include the initial finding, the persons responsible for the corrective action, the due date for responding to the auditing body, the root cause of the finding, and the corrective actions needed for resolution. The SQM/QM is also responsible for providing any back-up documentation used to demonstrate that a corrective action has been completed.

9.2.4. **Data Review**

9.2.4.1. In the course of performing primary and secondary review of data or in the case of raw data reviews (e.g., by the SQM/QM), errors may be found which require corrective actions. Any finding that affects the quality of the data requires some form of corrective action, which may include revising and re-issuing of final reports.

9.2.5. **Client Complaints**

9.2.5.1. Project Managers are responsible for issuing corrective action forms, when warranted, for customer complaints. As with other corrective actions, the possible causes of the problem are listed and the form is passed to the appropriate analyst or supervisor for investigation. After potential corrective actions have been determined, the Project Manager reviews the corrective action form to ensure all customer needs or concerns are being adequately addressed.

9.2.6. **Client Inquiries**

9.2.6.1. When an error on the customer report is discovered, the Project Manager is responsible for initiating a formal corrective action form that describes the failure (e.g., incorrect analysis reported, reporting units are incorrect, or reporting limits do not meet objectives). The Project Manager is also responsible for revising the final report if necessary and submitting it to the customer.

9.2.7. **Holding Time Violations**

9.2.7.1. In the event that a holding time has been missed, the analyst or supervisor must complete a formal corrective action form. The Project Manager and the SQM/QM must be made aware of all holding time violations.

9.2.7.2. The Project Manager must contact the customer in order that appropriate decisions are made regarding the hold time excursion and the ultimate resolution is then documented and included in the customer project file.

9.3. Preventive Action Documentation

9.3.1. Pace laboratories can take advantage of several available information sources in order to identify needed improvements in all of their systems including technical, managerial, and quality. These sources may include:

- Management Continuous Improvement Plan (CIP) metrics which are used by all production departments within Pace. When groups compare performance across the company, ways to improve systems may be discovered. These improvements can be made within a department or laboratory-wide.
- Annual managerial reviews- part of this TNI-required and NVLAP-required review is to look at all processes and procedures used by the laboratory over the past year and to determine ways to improve these processes in the future.
- Quality systems reviews- any frequent checks of quality systems (monthly logbook reviews, etc.) can uncover issues that can be corrected or adjusted before they become a larger issue.

9.3.2. When improvement opportunities are identified or if preventive action is required, the laboratory can develop, implement, and monitor preventive action plans.

10.0. GLOSSARY

The source of some of the definitions is indicated previous to the actual definition (e.g., TNI, DoD).

Terms and Definitions	
3P Program	The Pace Analytical continuous improvement program that focuses on Process, Productivity, and Performance. Best Practices are identified that can be used by all PASI labs.
Acceptance Criteria	TNI and DoD- Specified limits placed on characteristics of an item, process, or service defined in requirement documents.
Accreditation	TNI and DoD- The process by which an agency or organization evaluates and recognizes a laboratory as meeting certain predetermined qualifications or standards, thereby accrediting the laboratory.
Accreditation Body	DoD- Authoritative body that performs accreditation.
Accuracy	TNI and DoD- The degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations; a data quality indicator.
Aliquot	DoD- A discrete, measured, representative portion of a sample taken for analysis.
Analysis	A combination of sample preparation and instrument determination.
Analysis Code (Acode)	All the set parameters of a test, such as Analytes, Method, Detection Limits and Price.
Analysis Sequence	A compilation of all samples, standards and quality control samples run during a specific amount of time on a particular instrument in the order they are analyzed.
Analyst	TNI and DoD- The designated individual who performs the “hands-on” analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.
Analyte	DoD- The specific chemicals or components for which a sample is analyzed; it may be a group of chemicals that belong to the same chemical family and are analyzed together.
Analytical Uncertainty	TNI- A subset of Measurement Uncertainty that includes all laboratory activities performed as part of the analysis.
Assessment	TNI - The evaluation process used to measure or establish the performance, effectiveness, and conformance of an organization and/or its system to defined criteria (to the standards and requirements of laboratory accreditation). DoD- The evaluation process used to measure the performance or effectiveness of a system and its elements against specific criteria. Note: In this standard (DoD), assessment is an all-inclusive term used to denote any of the following: audit, performance evaluation, peer review, inspection, or surveillance.
Atomic Absorption Spectrometer	Instrument used to measure concentration in metals samples.
Atomization	DoD -A process in which a sample is converted to free atoms.

Audit	TNI- A systematic and independent examination of facilities, equipment, personnel, training, procedures, record-keeping, data validation, data management, and reporting aspects of a system to determine whether QA/QC and technical activities are being conducted as planned and whether these activities will effectively achieve quality objectives. DoD- A systematic evaluation to determine the conformance to quantitative and qualitative specifications of some operational function or activity.
Batch	TNI and DoD- Environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A **preparation batch** is composed of one to 20 environmental samples of the same quality systems matrix, meeting the above-mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours. An analytical batch is composed of prepared environmental samples (extracts, digestates or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various quality system matrices and can exceed 20 samples. South Carolina- same definition as TNI except 24 hours should be changed to 8 hours.
Bias	TNI- The systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value).
Blank	TNI and DoD- A sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usual analytical and measurement process to establish a zero baseline or background value and is sometimes used to adjust or correct routine analytical results.
Blind Sample	DoD-A sub-sample for analysis with a composition known to the submitter. The analyst/laboratory may know the identity of the sample but not its composition. It is used to test the analyst's or laboratory's proficiency in the execution of the measurement process.
BNA (Base Neutral Acid compounds)	A list of semi-volatile compounds typically analyzed by mass spectrometry methods. Named for the way they can be extracted out of environmental samples in an acidic, basic or neutral environment.
BOD (Biochemical Oxygen Demand)	Chemical procedure for determining how fast biological organisms use up oxygen in a body of water.
Calibration	TNI and DoD- A set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realized by standards. 1) In calibration of support equipment, the values realized by standards are established through the use of reference standards that are traceable to the International System of Units (SI); 2) In calibration according to test methods, the values realized by standards are typically established through the use of Reference Materials that are either purchased by the laboratory with a certificate of analysis or purity, or prepared by the laboratory using support equipment that has been calibrated or verified to meet specifications.

Calibration Curve	TNI- The mathematical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response. DoD- The graphical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response.
Calibration Method	DoD- A defined technical procedure for performing a calibration.
Calibration Range	DoD- The range of values (concentrations) between the lowest and highest calibration standards of a multi-level calibration curve. For metals analysis with a single-point calibration, the low-level calibration check standard and the high standard establish the linear calibration range, which lies within the linear dynamic range.
Calibration Standard	TNI- A substance or reference material used for calibration. DoD- A substance or reference material used to calibrate an instrument.
Certified Reference Material (CRM)	TNI- Reference material accompanied by a certificate, having a value, measurement uncertainty, and stated metrological traceability chain to a national metrology institute. DoD- A reference material one or more of whose property values are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation which is issued by a certifying body.
Chain of Custody	DoD- An unbroken trail of accountability that verifies the physical security of samples, data, and records.
Chain of custody Form (COC)	TNI and DoD- Record that documents the possession of the samples from the time of collection to receipt in the laboratory. This record generally includes: the number and type of containers; the mode of collection, the collector, time of collection; preservation; and requested analyses.
Chemical Oxygen Demand (COD)	A test commonly used to indirectly measure the amount of organic compounds in water.
Client (referred to by ISO as Customer)	DoD- Any individual or organization for whom items or services are furnished or work performed in response to defined requirements and expectations.
Code of Federal Regulations (CFR)	A codification of the general and permanent rules published in the Federal Register by agencies of the federal government.
Comparability	An assessment of the confidence with which one data set can be compared to another. Comparable data are produced through the use of standardized procedures and techniques.
Completeness	The percent of valid data obtained from a measurement system compared to the amount of valid data expected under normal conditions. The equation for completeness is: % Completeness = (Valid Data Points/Expected Data Points)*100
Confirmation	TNI and DoD- Verification of the identity of a component through the use of an approach with a different scientific principle from the original method. These may include, but are not limited to: second-column confirmation; alternate wavelength; derivatization; mass spectral interpretation; alternative detectors; or additional cleanup procedures.
Conformance	DoD- An affirmative indication or judgment that a product or service has met the requirements of the relevant specifications, contract, or regulation; also the state of meeting the requirements.

Congener	DoD- A member of a class of related chemical compounds (e.g., PCBs, PCDDs).
Consensus Standard	DoD- A standard established by a group representing a cross-section of a particular industry or trade, or a part thereof.
Continuing Calibration Blank (CCB)	A blank sample used to monitor the cleanliness of an analytical system at a frequency determined by the analytical method.
Continuing Calibration Check Compounds (CCC)	Compounds listed in mass spectrometry methods that are used to evaluate an instrument calibration from the standpoint of the integrity of the system. High variability would suggest leaks or active sites on the instrument column.
Continuing Calibration Verification	DoD- The verification of the initial calibration. Required prior to sample analysis and at periodic intervals. Continuing calibration verification applies to both external and internal standard calibration techniques, as well as to linear and non-linear calibration models.
Continuing Calibration Verification (CCV) Standard	Also referred to as a CVS in some methods, it is a standard used to verify the initial calibration of compounds in an analytical method. CCVs are analyzed at a frequency determined by the analytical method.
Continuous Emission Monitor (CEM)	A flue gas analyzer designed for fixed use in checking for environmental pollutants.
Contract Laboratory Program (CLP)	A national network of EPA personnel, commercial labs, and support contractors whose fundamental mission is to provide data of known and documented quality.
Contract Required Detection Limit (CRDL)	Detection limit that is required for EPA Contract Laboratory Program (CLP) contracts.
Contract Required Quantitation Limit (CRQL)	Quantitation limit (reporting limit) that is required for EPA Contract Laboratory Program (CLP) contracts.
Control Chart	A graphic representation of a series of test results, together with limits within which results are expected when the system is in a state of statistical control (see definition for Control Limit)
Control Limit	A range within which specified measurement results must fall to verify that the analytical system is in control. Control limit exceedances may require corrective action or require investigation and flagging of non-conforming data.
Correction	DoD- Action taken to eliminate a detected non-conformity.
Corrective Action	DoD- The action taken to eliminate the causes of an existing non-conformity, defect, or other undesirable situation in order to prevent recurrence. A root cause analysis may not be necessary in all cases.
Corrective and Preventative Action (CAPA)	The primary management tools for bringing improvements to the quality system, to the management of the quality system's collective processes, and to the products or services delivered which are an output of established systems and processes.
Customer	DoD- Any individual or organization for which products or services are furnished or work performed in response to defined requirements and expectations.

Data Quality Objective (DQO)	Systematic strategic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use or end user.
Data Reduction	TNI- The process of transforming the number of data items by arithmetic or statistical calculation, standard curves, and concentration factors, and collating them into a more usable form.
Definitive Data	DoD- Analytical data of known quantity and quality. The levels of data quality on precision and bias meet the requirements for the decision to be made. Data that is suitable for final decision-making.
Demonstration of Capability	TNI- A procedure to establish the ability of the analyst to generate analytical results of acceptable accuracy and precision. DoD- A procedure to establish the ability of the analyst to generate analytical results by a specific method that meet measurement quality objectives (e.g., for precision and bias).
Detection Limit (DL)	DoD- The smallest analyte concentration that can be demonstrated to be different than zero or a blank concentration at the 99% confidence. At the DL, the false positive rate (Type 1 error) is 1%. A DL may be used as the lowest concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence.
Diesel Range Organics (DRO)	A range of compounds that denote all the characteristic compounds that make up diesel fuel (range can be state or program specific).
Digestion	DoD- A process in which a sample is treated (usually in conjunction with heat and acid) to convert the sample to a more easily measured form.
Document Control	DoD- The act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.
Documents	DoD- Written components of the laboratory management system (e.g., policies, procedures, and instructions).
Dry Weight	The weight after drying in an oven at a specified temperature.
Duplicate (also known as Replicate or Laboratory Duplicate)	DoD- The analyses or measurements of the variable of interest performed identically on two subsamples of the same sample. The results of duplicate analyses are used to evaluate analytical or measurement precision but not the precision of sampling, preservation or storage internal to the laboratory.
Electron Capture Detector (ECD)	Device used in GC methods to detect compounds that absorb electrons (e.g., PCB compounds).
Electronic Data Deliverable (EDD)	A summary of environmental data (usually in spreadsheet form) which clients request for ease of data review and comparison to historical results.
Eluent	DoD- A solvent used to carry the components of a mixture through a stationary phase.
Elute	DoD- To extract, specifically, to remove (absorbed material) from an absorbent by means of a solvent.
Elution	DoD- A process in which solutes are washed through a stationary phase by movement of a mobile phase.
Environmental Data	DoD- Any measurements or information that describe environmental processes, locations, or conditions; ecological or health effects and consequences; or the performance of environmental technology.

Environmental Monitoring	DoD- The process of measuring or collecting environmental data.
Environmental Sample	A representative sample of any material (aqueous, non-aqueous, or multimedia) collected from any source for which determination of composition or contamination is requested or required. Environmental samples can generally be classified as follows: • Non Potable Water (Includes surface water, ground water, effluents, water treatment chemicals, and TCLP leachates or other extracts) • Drinking Water - Delivered (treated or untreated) water designated as potable water • Water/Wastewater - Raw source waters for public drinking water supplies, ground waters, municipal influents/effluents, and industrial influents/effluents • Sludge - Municipal sludges and industrial sludges. • Soil - Predominately inorganic matter ranging in classification from sands to clays. • Waste - Aqueous and non-aqueous liquid wastes, chemical solids, and industrial liquid and solid wastes
Equipment Blank	A sample of analyte-free media used to rinse common sampling equipment to check effectiveness of decontamination procedures.
Facility	A distinct location within the company that has unique certifications, personnel and waste disposal identifications.
False Negative	DoD- A result that fails to identify (detect) an analyte or reporting an analyte to be present at or below a level of interest when the analyte is actually above the level of interest.
False Positive	DoD- A result that erroneously identifies (detects) an analyte or reporting an analyte to be present above a level of interest when the analyte is actually present at or below the level of interest.
Field Blank	A blank sample prepared in the field by filling a clean container with reagent water and appropriate preservative, if any, for the specific sampling activity being undertaken.
Field Measurement	Determination of physical, biological, or radiological properties, or chemical constituents that are measured on-site, close in time and space to the matrices being sampled/measured, following accepted test methods. This testing is performed in the field outside of a fixed-laboratory or outside of an enclosed structure that meets the requirements of a mobile laboratory.
Field of Accreditation	TNI- Those matrix, technology/method, and analyte combinations for which the accreditation body offers accreditation.
Finding	TNI- An assessment conclusion referenced to a laboratory accreditation standard and supported by objective evidence that identifies a deviation from a laboratory accreditation standard requirement. DoD- An assessment conclusion that identifies a condition having a significant effect on an item or activity. An assessment finding may be positive, negative, or neutral and is normally accompanied by specific examples of the observed condition. The finding must be linked to a specific requirement (e.g., this standard (DoD QSM), ISO requirements, analytical methods, contract specifications, or laboratory management systems requirements).

Flame Atomic Absorption Spectrometer (FAA)	Instrumentation used to measure the concentration of metals in an environmental sample based on the fact that ground state metals absorb light at different wavelengths. Metals in a solution are converted to the atomic state by use of a flame.
Flame Ionization Detector (FID)	A type of gas detector used in GC analysis where samples are passed through a flame which ionizes the sample so that various ions can be measured.
Gas Chromatography (GC)	Instrumentation which utilizes a mobile carrier gas to deliver an environmental sample across a stationary phase with the intent to separate compounds out and measure their retention times.
Gas Chromatograph/ Mass Spectrometry (GC/MS)	In conjunction with a GC, this instrumentation utilizes a mass spectrometer which measures fragments of compounds and determines their identity by their fragmentation patterns (mass spectra).
Gasoline Range Organics (GRO)	A range of compounds that denote all the characteristic compounds that make up gasoline (range can be state or program specific).
Graphite Furnace Atomic Absorption Spectrometry (GFAA)	Instrumentation used to measure the concentration of metals in an environmental sample based on the absorption of light at different wavelengths that are characteristic of different analytes.
High Pressure Liquid Chromatography (HPLC)	Instrumentation used to separate, identify and quantitate compounds based on retention times which are dependent on interactions between a mobile phase and a stationary phase.
Holding Time	TNI- The maximum time that can elapse between two specified activities. 40 CFR Part 136- The maximum time that samples may be held prior to preparation and/or analysis as defined by the method and still be considered valid or not compromised. For sample prep purposes, hold times are calculated using the time of the start of the preparation procedure. DoD- The maximum time that may elapse from the time of sampling to the time of preparation or analysis, or from preparation to analysis, as appropriate.
Homogeneity	The degree to which a property or substance is uniformly distributed throughout a sample.
Homologue	DoD- One in a series of organic compounds in which each successive member has one more chemical group in its molecule than the next preceding member. For instance, methanol, ethanol, propanol, butanol, etc., form a homologous series.
Improper Actions	DoD- Intentional or unintentional deviations from contract-specified or method-specified analytical practices that have not been authorized by the customer (e.g., DoD or DOE).
Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	Analytical technique used for the detection of trace metals which uses plasma to produce excited atoms that emit radiation of characteristic wavelengths.
Inductively Coupled Plasma- Mass Spectrometry (ICP/MS)	An ICP-AES that is used in conjunction with a mass spectrometer so that the instrument is not only capable of detecting trace amounts of metals and non-metals but is also capable of monitoring isotopic speciation for the ions of choice.

Infrared Spectrometer (IR)	An instrument that uses infrared light to identify compounds of interest.
Initial Calibration (ICAL)	The process of analyzing standards, prepared at specified concentrations, to define the quantitative response relationship of the instrument to the analytes of interest. Initial calibration is performed whenever the results of a calibration verification standard do not conform to the requirements of the method in use or at a frequency specified in the method.
Initial Calibration Blank (ICB)	A blank sample used to monitor the cleanliness of an analytical system at a frequency determined by the analytical method. This blank is specifically run in conjunction with the Initial Calibration Verification (ICV) where applicable.
Initial Calibration Verification (ICV)	DoD- Verifies the initial calibration with a standard obtained or prepared from a source independent of the source of the initial calibration standards to avoid potential bias of the initial calibration.
Inspection	DoD- An activity such as measuring, examining, testing, or gauging one or more characteristics of an entity and comparing the results with specified requirements in order to establish whether conformance is achieved for each characteristic.
Instrument Blank	DoD- A clean sample (e.g., distilled water) processed through the instrumental steps of the measurement process; used to determine instrument contamination.
Instrument Detection Limits (IDLs)	Limits determined by analyzing a series of reagent blank analyses to obtain a calculated concentration. IDLs are determined by calculating the average of the standard deviations of three runs on three non-consecutive days from the analysis of a reagent blank solution with seven consecutive measurements per day.
Interference, spectral	DoD- Occurs when particulate matter from the atomization scatters incident radiation from the source or when the absorption or emission from an interfering species either overlaps or is so close to the analyte wavelength that resolution becomes impossible.
Interference, chemical	DoD- Results from the various chemical processes that occur during atomization and later the absorption characteristics of the analyte.
Internal Standards	TNI and DoD- A known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method.
Intermediate Standard Solution	Reference solutions prepared by dilution of the stock solutions with an appropriate solvent.
International System of Units (SI)	DoD- The coherent system of units adopted and recommended by the General Conference on Weights and Measures.
Ion Chromatography (IC)	Instrumentation or process that allows the separation of ions and molecules based on the charge properties of the molecules.
Isomer	One of two or more compounds, radicals, or ions that contain the same number of atoms of the same element but differ in structural arrangement and properties. For example, hexane (C6H14) could be n-hexane, 2-methylpentane, 3-methylpentane, 2,3-dimethylbutane, 2,2-dimethylbutane.
Laboratory	DoD- A body that calibrates and/or tests.

Laboratory Control Sample (LCS)	TNI and DoD- (however named, such as laboratory fortified blank (LFB), spiked blank, or QC check sample): A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes and taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a reference method. It is generally used to establish intra-laboratory or analyst-specific precision and bias or to evaluate the performance of all or a portion of the measurement system.
Laboratory Duplicate	DoD- Aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently.
Laboratory Information Management System (LIMS)	A computer system that is used to maintain all sample information from sample receipt, through preparation and analysis and including sample report generation.
LabTrack	Database used by Pace Analytical to store and track corrective actions and other laboratory issues.
Learning Management System (LMS)	A web-based database used by the laboratories to track and document training activities. The system is administered by the corporate training department and each laboratory's learn centers are maintained by a local administrator.
Legal Chain-of-Custody Protocols	TNI- Procedures employed to record the possession of samples from the time of sampling through the retention time specified by the client or program. These procedures are performed at the special request of the client and include the use of a Chain-of-Custody (COC) Form that documents the collection, transport, and receipt of compliance samples by the laboratory. In addition, these protocols document all handling of the samples within the laboratory.
Limit(s) of Detection (LOD)	TNI- A laboratory's estimate of the minimum amount of an analyte in a given matrix that an analytical process can reliably detect in their facility. DoD- The smallest concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate is 1%.
Limit(s) of Quantitation (LOQ)	TNI- The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. DoD- The smallest concentration that produces a quantitative result with known and recorded precision and bias. For DoD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard and within the calibration range.
Linear Dynamic Range	DoD- Concentration range where the instrument provides a linear response.
Liquid chromatography/ tandem mass spectrometry (LC/MS/MS)	Instrumentation that combines the physical separation techniques of liquid chromatography with the mass analysis capabilities of mass spectrometry.
Lot	A quantity of bulk material of similar composition processed or manufactured at the same time.
Management	DoD- Those individuals directly responsible and accountable for planning, implementing, and assessing work.

Management System	DoD- System to establish policy and objectives and to achieve those objectives.
Manager (however named)	DoD- The individual designated as being responsible for the overall operation, all personnel, and the physical plant of the environmental laboratory. A supervisor may report to the manager. In some cases, the supervisor and the manager may be the same individual.
Matrix	TNI and DoD- The substrate of a test sample.
Matrix Duplicate	TNI- A replicate matrix prepared in the laboratory and analyzed to obtain a measure of precision.
Matrix Spike (MS) (spiked sample or fortified sample)	TNI- A sample prepared, taken through all sample preparation and analytical steps of the procedure unless otherwise noted in a referenced method, by adding a known amount of target analyte to a specified amount of sample for which an independent test result of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency. DoD- A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency.
Matrix Spike Duplicate (MSD) (spiked sample or fortified sample duplicate)	TNI and DoD- A replicate matrix spike prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte.
Measurement Performance Criteria (MPC)	Criteria that may be general (such as completion of all tests) or specific (such as QC method acceptance limits) that are used by a project to judge whether a laboratory can perform a specified activity to the defined criteria.
Measurement System	TNI and DoD- A test method, as implemented at a particular laboratory, and which includes the equipment used to perform the sample preparation, test and the operator(s).
Measurement Uncertainty	An estimate of the error in a measurement often stated as a range of values that contain the true value, within a certain confidence level. The uncertainty generally includes many components which may be evaluated from experimental standard deviations based on repeated observations or by standard deviations evaluated from assumed probability distributions based on experience or other information. For DoD/DOE, a laboratory's Analytical Uncertainty (such as use of LCS control limits) can be reported as the minimum uncertainty.
Method	TNI- A body of procedures and techniques for performing an activity (e.g., sampling, chemical analysis, quantification), systematically presented in the order in which they are to be executed.
Method Blank	TNI and DoD- A sample of a matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses.

Method Detection Limit (MDL)	DoD- One way to establish a Detection Limit; defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.
Method of Standard Additions	DoD- A set of procedures adding one or more increments of a standard solution to sample aliquots of the same size in order to overcome inherent matrix effects. The procedures encompass the extrapolation back to obtain the sample concentration.
MintMiner	Program used by Pace Analytical to review large amounts of chromatographic data to monitor for errors or data integrity issues.
Mobile Laboratory	TNI- A portable enclosed structure with necessary and appropriate accommodation and environmental conditions for a laboratory, within which testing is performed by analysts. Examples include but are not limited to trailers, vans, and skid-mounted structures configured to house testing equipment and personnel.
National Institute of Standards and Technology (NIST)	TNI- A federal agency of the US Department of Commerce's Technology Administration that is designed as the United States national metrology institute (or NMI).
National Pollutant Discharge Elimination System (NPDES)	A permit program that controls water pollution by regulating point sources that discharge pollutants into U.S. waters.
Negative Control	DoD- Measures taken to ensure that a test, its components, or the environment do not cause undesired effects, or produce incorrect test results.
Nitrogen Phosphorus Detector (NPD)	A detector used in GC analyses that utilizes thermal energy to ionize an analyte. With this detector, nitrogen and phosphorus can be selectively detected with a higher sensitivity than carbon.
Nonconformance	DoD- An indication or judgment that a product or service has not met the requirement of the relevant specifications, contract, or regulation; also the state of failing to meet the requirements.
Not Detected (ND)	The result reported for a compound when the detected amount of that compound is less than the method reporting limit.
Operator Aid	A technical posting (such as poster, operating manual, or notepad) that assists workers in performing routine tasks. All operator aids must be controlled documents (i.e., a part of the laboratory management system).
Performance Based Measurement System (PBMS)	An analytical system wherein the data quality needs, mandates or limitations of a program or project are specified and serve as criteria for selecting appropriate test methods to meet those needs in a cost-effective manner.
Photo-ionization Detector (PID)	An ion detector which uses high-energy photons, typically in the ultraviolet range, to break molecules into positively charged ions.
Polychlorinated Biphenyls (PCB)	A class of organic compounds that were used as coolants and insulating fluids for transformers and capacitors. The production of these compounds was banned in the 1970's due to their high toxicity.
Positive Control	DoD- Measures taken to ensure that a test and/or its components are working properly and producing correct or expected results from positive test subjects.
Post-Digestion Spike	A sample prepared for metals analyses that has analytes spike added to determine if matrix effects may be a factor in the results.
Power of Hydrogen (pH)	The measure of acidity or alkalinity of a solution.

Practical Quantitation Limit (PQL)	Another term for a method reporting limit. The lowest reportable concentration of a compound based on parameters set up in an analytical method and the laboratory's ability to reproduce those conditions.
Precision	TNI and DoD- The degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed as standard deviation, variance or range, in either absolute or relative terms.
Preservation	TNI- Any conditions under which a sample must be kept in order to maintain chemical, physical, and/or biological integrity prior to analysis. DoD- Refrigeration and/or reagents added at the time of sample collection (or later) to maintain the chemical and/or biological integrity of the sample.
Procedure	TNI- A specified way to carry out an activity or process. Procedures can be documented or not.
Proficiency Testing	TNI and DoD- A means of evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source.
Proficiency Testing Program	TNI and DoD- The aggregate of providing rigorously controlled and standardized environmental samples to a laboratory for analysis, reporting of results, statistical evaluation of the results and the collective demographics and results summary of all participating laboratories.
Proficiency Testing Sample (PT)	TNI- A sample, the composition of which is unknown to the laboratory and is provided to test whether the laboratory can produce analytical results within the specified acceptance criteria. DoD- A sample, the composition of which is unknown to the analyst and is provided to test whether the analyst/laboratory can produce analytical results within specified acceptance criteria.
Protocol	TNI and DoD- A detailed written procedure for field and/or laboratory operation (e.g., sampling, analysis) that must be strictly followed.
Qualitative Analysis	DoD- Analysis designed to identify the components of a substance or mixture.
Quality Assurance (QA)	TNI- An integrated system of management activities involving planning, implementation, assessment, reporting and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the client. DoD- An integrated system of activities involving planning, quality control, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.
Quality Assurance Manual (QAM)	A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users.
Quality Assurance Project Plan (QAPP)	DoD- A formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.

Quality Control (QC)	TNI- The overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality; also the system of activities and checks used to ensure that measurement systems are maintained within prescribed limits, providing protection against "out of control" conditions and ensuring that the results are of acceptable quality. DoD- The overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of the users.
Quality Control Sample (QCS)	TNI- A sample used to assess the performance of all or a portion of the measurement system. One of any number of samples, such as Certified Reference Materials, a quality system matrix fortified by spiking, or actual samples fortified by spiking, intended to demonstrate that a measurement system or activity is in control. DoD- A sample used to assess the performance of all or a portion of the measurement system. One of any number of samples, such as Certified Reference Materials, a quality system matrix fortified by spiking, or actual samples fortified by spiking.
Quality Manual	TNI and DoD- A document stating the management policies, objectives, principles, organizational structure and authority, responsibilities, accountability, and implementation of an agency, organization, or laboratory, to ensure the quality of its product and the utility of its product to its users.
Quality System	TNI and DoD- A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance and quality control activities.

Quality System Matrix	TNI and DoD- These matrix definitions are to be used for purposes of batch and quality control requirements: • **Air and Emissions**: Whole gas or vapor samples including those contained in flexible or rigid wall containers and the extracted concentrated analytes of interest from a gas or vapor that are collected with a sorbant tube, impinger solution, filter, or other device • **Aqueous**: Any aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine. Includes surface water, groundwater effluents, and TCLP or other extracts. • **Biological Tissue**: Any sample of a biological origin such as fish tissue, shellfish or plant material. Such samples shall be grouped according to origin. • **Chemical Waste**: A product or by-product of an industrial process that results in a matrix not previously defined. • **Drinking Water**: Any aqueous sample that has been designated a potable or potentially potable water source. • **Non-aqueous liquid**: Any organic liquid with <15% settleable solids • **Saline/Estuarine**: Any aqueous sample from an ocean or estuary, or other salt water source such as the Great Salt Lake. • **Solids**: Includes soils, sediments, sludges, and other matrices with >15% settleable solids.
Quantitation Range	DoD- The range of values (concentrations) in a calibration curve between the LOQ and the highest successively analyzed initial calibration standard. The quantitation range lies within the calibration range.
Quantitative Analysis	Analysis designed to determine the amounts or proportions of the components of a substance.
Random Error	The EPA has established that there is a 5% probability that the results obtained for any one analyte will exceed the control limits established for the test due to random error. As the number of compounds measured increases in a given sample, the probability for statistical error also increases.
Raw Data	TNI- The documentation generated during sampling and analysis. This documentation includes, but is not limited to, field notes, electronic data, magnetic tapes, untabulated sample results, QC sample results, print outs of chromatograms, instrument outputs, and handwritten records. DoD- Any original factual information from a measurement activity or study recorded in a laboratory notebook, worksheets, records, memoranda, notes, or exact copies thereof that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, microfilm or microfiche copies, computer printouts, magnetic media, including dictated observations, and recorded data from automated instruments. If exact copies of raw data have been prepared (e.g., tapes which have been transcribed verbatim, data and verified accurate by signature), the exact copy or exact transcript may be submitted.
Reagent Blank (method reagent blank)	DoD- A sample consisting of reagent(s), without the target analyte or sample matrix, introduced into the analytical procedure at the appropriate point and carried through all subsequent steps to determine the contribution of the reagents and of the involved analytical steps.

Reagent Grade	Analytical reagent (AR) grade, ACS reagent grade, and reagent grade are synonymous terms for reagents that conform to the current specifications of the Committee on Analytical Reagents of the American Chemical Society.
Records	DoD- The output of implementing and following management system documents (e.g., test data in electronic or hand-written forms, files, and logbooks).
Reference Material	TNI- Material or substance one or more of whose property values are sufficiently homogenized and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials. DoD- A material or substance one or more properties of which are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.
Reference Standard	TNI- Standard used for the calibration of working measurement standards in a given organization or at a given location. DoD- A standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.
Reference Toxicant	DoD- The toxicant used in performing toxicity tests to indicate the sensitivity of a test organism and to demonstrate the laboratory's ability to perform the test correctly and obtain consistent results.
Relative Percent Difference (RPD)	A measure of precision defined as the difference between two measurements divided by the average concentration of the two measurements.
Reporting Limit (RL)	The level at which method, permit, regulatory and customer-specific objectives are met. The reporting limit may never be lower than the Limit of Detection (i.e., statistically determined MDL). Reporting limits are corrected for sample amounts, including the dry weight of solids, unless otherwise specified. There must be a sufficient buffer between the Reporting Limit and the MDL. DoD- A customer-specified lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.
Reporting Limit Verification Standard (or otherwise named)	A standard analyzed at the reporting limit for an analysis to verify the laboratory's ability to report to that level.
Representativeness	A quality element related to the ability to collect a sample reflecting the characteristics of the part of the environment to be assessed. Sample representativeness is dependent on the sampling techniques specified in the project work plan.
Requirement	DoD- Denotes a mandatory specification; often designated by the term "shall".
Retention Time	DoD- The time between sample injection and the appearance of a solute peak at the detector.
Sample	DoD- Portion of material collected for analysis, identified by a single, unique alphanumeric code. A sample may consist of portions in multiple containers, if a single sample is submitted for multiple or repetitive analysis.
Sample Condition Upon Receipt Form (SCURF)	Form used by Pace Analytical sample receiving personnel to document the condition of sample containers upon receipt to the laboratory (used in conjunction with a COC).

Sample Delivery Group (SDG)	A unit within a single project that is used to identify a group of samples for delivery. An SDG is a group of 20 or fewer field samples within a project, received over a period of up to 14 calendar days. Data from all samples in an SDG are reported concurrently.
Sample Receipt Form (SRF)	Letter sent to the client upon login to show the tests requested and pricing.
Sample Tracking	Procedures employed to record the possession of the samples from the time of sampling until analysis, reporting and archiving. These procedures include the use of a Chain of custody Form that documents the collection, transport, and receipt of compliance samples to the laboratory. In addition, access to the laboratory is limited and controlled to protect the integrity of the samples.
Sampling	TNI- Activity related to obtaining a representative sample of the object of conformity assessment, according to a procedure.
Selective Ion Monitoring (SIM)	A mode of analysis in mass spectrometry where the detector is set to scan over a very small mass range, typically one mass unit. The narrower the range, the more sensitive the detector.
Selectivity	TNI- The ability to analyze, distinguish, and determine a specific analyte or parameter from another component that may be a potential interferent or that may behave similarly to the target analyte or parameter within the measurement system. DoD- The capability of a test method or instrument to respond to a target substance or constituent in the presence of non-target substances.
Sensitivity	TNI and DoD- The capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest.
Serial Dilution	The stepwise dilution of a substance in a solution.
Shall	DoD- Denotes a requirement that is mandatory whenever the criterion for conformance with the specification requires that there be no deviation. This does not prohibit the use of alternative approaches or methods for implementing the specification as long as the requirement is fulfilled.
Should	DoD- Denotes a guideline or recommendation whenever noncompliance with the specification is permissible.
Signal-to-Noise Ratio (S/N)	DoD- S/N is a measure of signal strength relative to background noise. The signal carries information about the analyte, while noise is made up of extraneous information that is unwanted because it degrades the accuracy and precision of an analysis and also places a lower limit on the amount of analyte that can be detected. The average strength of the noise of most measurements is constant and independent of the magnitude of the signal. Thus, as the quantity being measured (producing the signal) decreases in magnitude, S/N decreases and the effect of the noise on the relative error of a measurement increases.
Spike	DoD- A known mass of target analyte added to a blank sample or sub-sample; used to determine recovery efficiency or for other quality control purposes.
Standard (Document)	TNI and DoD- The document describing the elements of a laboratory accreditation that has been developed and established within the consensus principles of standard setting and meets the approval requirements of standard adoption organizations procedures and policies.

Standard (Chemical)	DoD- Standard samples are comprised of a known amount of standard reference material in the matrix undergoing analysis. A standard reference material is a certified reference material produced by US NIST and characterized for absolute content, independent of analytical test method.
Standard Blank (or Reagent Blank)	A calibration standard consisting of the same solvent/reagent matrix used to prepare the calibration standards without the analytes. It is used to construct the calibration curve by establishing instrument background.
Standard Method	DoD- A test method issued by an organization generally recognized as competent to do so.
Standard Operating Procedure (SOP)	TNI- A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps. SOPs are officially approved as the methods for performing certain routine or repetitive tasks. DoD- A written document which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks.
Standard Reference Material (SRM)	DoD- A certified reference material produced by the US NIST or other equivalent organization and characterized for absolute content, independent of analytical method.
Statement of Qualifications (SOQ)	A document that lists information about a company, typically the qualifications of that company to compete on a bid for services.
Stock Standard	A concentrated reference solution containing one or more analytes prepared in the laboratory using an assayed reference compound or purchased from a reputable commercial source.
Storage Blank	DoD- A sample of analyte-free media prepared by the laboratory and retained in the sample storage area of the laboratory. A storage blank is used to record contamination attributable to sample storage at the laboratory.
Supervisor	DoD- The individual(s) designated as being responsible for a particular area or category of scientific analysis. This responsibility includes direct day-to-day supervision of technical employees, supply and instrument adequacy and upkeep, quality assurance/quality control duties and ascertaining that technical employees have the required balance of education, training and experience to perform the required analyses.
Surrogate	DoD- A substance with properties that mimic the analyte of interest. It is unlikely to be found in environment samples and is added to them for quality control purposes.
Systems Audit	An on-site inspection or assessment of a laboratory's quality system.
Target Analytes	DoD- Analytes or chemicals of primary concern, identified by the customer on a project-specific basis.
Technical Director	DoD- Individual(s) who has overall responsibility for the technical operation of the environmental testing laboratory.
Technology	TNI- A specific arrangement of analytical instruments, detection systems, and/or preparation techniques.

Test	DoD- A technical operation that consists of the determination of one or more characteristics or performance of a given product, material, equipment, organism, physical phenomenon, process or service according to a specified procedure. The result of a test is normally recorded in a document sometimes called a test report or a test certificate.
Test Method	DoD- A definitive procedure that determines one or more characteristics of a given substance or product.
Test Methods for Evaluating Solid Waste, Physical/ Chemical (SW-846)	EPA Waste's official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with RCRA regulations.
Total Petroleum Hydrocarbons (TPH)	A term used to denote a large family of several hundred chemical compounds that originate from crude oil. Compounds may include gasoline components, jet fuel, volatile organics, etc.
Toxicity Characteristic Leaching Procedure (TCLP)	A solid sample extraction method for chemical analysis employed as an analytical method to simulate leaching of compounds through a landfill.
Traceability	TNI- The ability to trace the history, application, or location of an entity by means of recorded identifications. In a calibration sense, traceability relates measuring equipment to national or international standards, primary standards, basic physical conditions or properties, or reference materials. In a data collection sense, it relates calculations and data generated throughout the project back to the requirements for the quality of the project. DoD- The property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons.
Training Document	A training resource that provides detailed instructions to execute a specific method or job function.
Trip Blank	This blank sample is used to detect sample contamination from the container and preservative during transport and storage of the sample. A cleaned sample container is filled with laboratory reagent water and the blank is stored, shipped, and analyzed with its associated samples.
Tuning	DoD- A check and/or adjustment of instrument performance for mass spectrometry as required by the method.
Ultraviolet Spectrophotometer (UV)	Instrument routinely used in quantitative determination of solutions of transition metal ions and highly conjugated organic compounds.
Uncertainty Measurement	The parameter associated with the result of a measurement that characterized the dispersion of the values that could be reasonably attributed to the measurand (i.e. the concentration of an analyte).
Unethical actions	DoD- Deliberate falsification of analytical or quality control results, where failed method or contractual requirements are made to appear acceptable.
Unregulated Contaminate Monitoring Rule (UCMR)	EPA program to monitor unregulated contaminates in drinking water.

Validation	DoD- The confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled.
Verification	TNI and DoD- Confirmation by examination and objective evidence that specified requirements have been met. Note: In connection with the management of measuring equipment, verification provides a means for checking that the deviations between values indicated by a measuring instrument and corresponding known values of a measured quantity are consistently smaller than the maximum allowable error defined in a standard, regulation or specification peculiar to the management of the measuring equipment. The result of verification leads to a decision either to restore in service, to perform adjustment, to repair, to downgrade, or to declare obsolete. In all cases, it is required that a written trace of the verification performed shall be kept on the measuring instrument's individual record.
Whole Effluent Toxicity (WET)	The aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's wastewater (effluent).
Work Cell	DoD- A well-defined group of analysts that together perform the method analysis. The members of the group and their specific functions within the work cell must be fully documented.

11.0. REFERENCES

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12.0. REVISIONS

The PASI Corporate Quality Office files both a paper copy and electronic version of a Microsoft Word document with tracked changes detailing all revisions made to the previous version of the Quality Assurance Manual. This document is available upon request. All revisions are summarized in the table below.

Document Number	Reason for Change	Date
Quality Assurance Manual 17.0	Section 1.77: Added HRMS to the breakdown of the laboratory department Section 2.6.5: Updated facility codes. Section 2.10: Added exception to Air canisters for sample retention Section 6.2.3.4: Reworded language regarding calibrations. Section 6.2.7.8: Removed OhioVAP as it is no longer pertain to the lab Section 6.3.7.1: Removed last sentence about syringes. Section 6.4.8: Added sentence about instrumentation failure. Section 7.2.6: Added language regarding auto email function. Section 7.5.1.1: Added red letter section for special data retention requirements. Section 9.2.7.2: Removed sentence regarding hold time reporting by QMs. Section 10: Updated DoD definitions per DoD/DOE QSM, revision 5.0. Also added definitions for LC/MS/MS and UCMR. Section 11: Revised DoD reference and added UCMR3 reference. Attachment VIII: added several drinking water methods and added note 4 regarding hexavalent holding time and preservation. Section 4.0: included a statement that refers the reader to the SOPs for detail Section 4.2.9: clarified MS cannot be used in place of the LCS for Ohio VAP project Section 4.3.8 and 4.4.1: indicated that the results are optional for Ohio VAP project Section 4.5.1.3: added that TO-15 surrogates are not evaluated for Ohio VAP samples 6.2.2: added exception for Ohio VAP sample Section 7.3.3: added Ohio VAP requirement for affidavit Attachment IIA-IIC: updated to current version Attachment III: updated to contain the most current information Attachment IVB: updated to new address floor plan Attachment V: updated list of SOPs to reflect the current use Attachment VI: updated expiration date Attachment VIII: added Additional Volume for MS/MSD column Included Pace-Virginia and Duluth information for a regional quality manual throughout the document.	13May2014
Quality Assurance Manual 17.1	Section 4.12.1: Changed NIST PT providers to TNI and state regulatory Attachment V-VI: Separated Virginia and Duluth to have its own individual tables Attachment II-III, V-VI: Updated to most current version Attachment IVC- Removed Duluth	18June2014

ATTACHMENT I- QUALITY CONTROL CALCULATIONS

PERCENT RECOVERY (%REC)

$$\%REC = \frac{(MSConc - SampleConc)}{TrueValue} * 100$$

NOTE: The SampleConc is zero (0) for theLCS and Surrogate Calculations

PERCENT DIFFERENCE (%D)

$$\%D = \frac{MeasuredValue - TrueValue}{TrueValue} * 100$$

where:
TrueValue = Amount spiked (can also be the $\overline{CF}$ or $\overline{RF}$ of the ICAL Standards)
Measured Value = Amount measured (can also be the CF or RF of the CCV)

PERCENT DRIFT

$$\%Drift = \frac{CalculatedConcentration - TheoreticalConcentration}{TheoreticalConcentrtion} * 100$$

RELATIVE PERCENT DIFFERENCE (RPD)

$$RPD = \frac{|(R1 - R2)|}{(R1 + R2)/2} * 100$$

where:
R1 = Result Sample 1
R2 = Result Sample 2

CORRELATION COEFFICIENT (R)

$$CorrCoeff = \frac{\sum_{i=1}^{N} W_i * (X_i - \overline{X}) * (Y_i - \overline{Y})}{\sqrt{\left(\sum_{i=1}^{N} W_i * (X_i - \overline{X})^2\right) * \left(\sum_{i=1}^{N} W_i * (Y_i - \overline{Y})^2\right)}}$$

With:	N	Number of standard samples involved in the calibration
	i	Index for standard samples
	Wi	Weight factor of the standard sample no. i
	Xi	X-value of the standard sample no. i
	X(bar)	Average value of all x-values
	Yi	Y-value of the standard sample no. i
	Y(bar)	Average value of all y-values

ATTACHMENT I- QUALITY CONTROL CALCULATIONS (CONTINUED)

STANDARD DEVIATION (S)

$$S = \sqrt{\sum_{i=1}^{n} \frac{(X_i - \overline{X})^2}{(n-1)}}$$

where:
n = number of data points
X_i = individual data point
$\overline{X}$ = average of all data points

AVERAGE ($\overline{X}$)

$$\overline{X} = \frac{\sum_{n=1}^{i} X_i}{n}$$

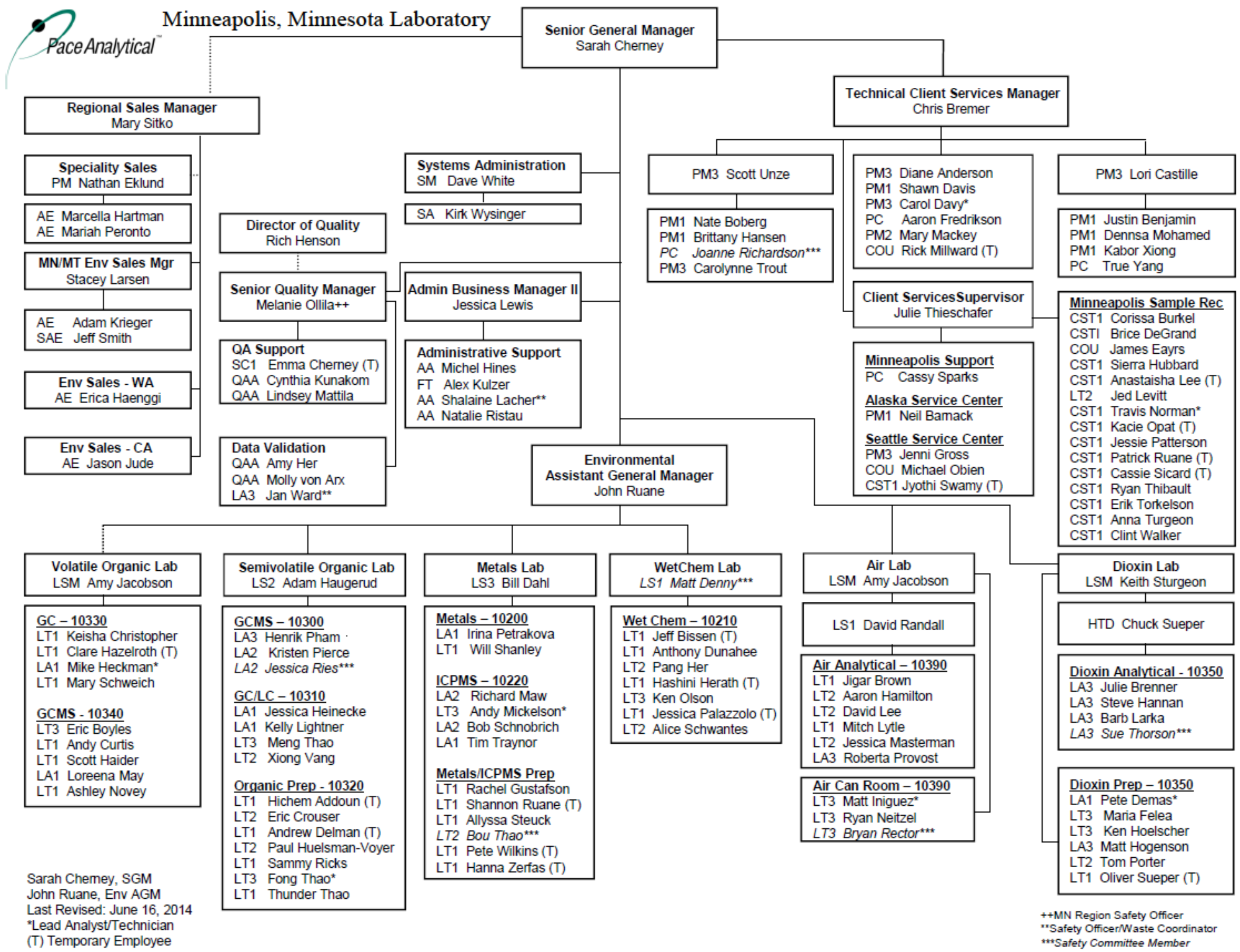
where:
n = number of data points
X_i = individual data point

RELATIVE STANDARD DEVIATION (RSD)

$$RSD = \frac{S}{\overline{X}} * 100$$

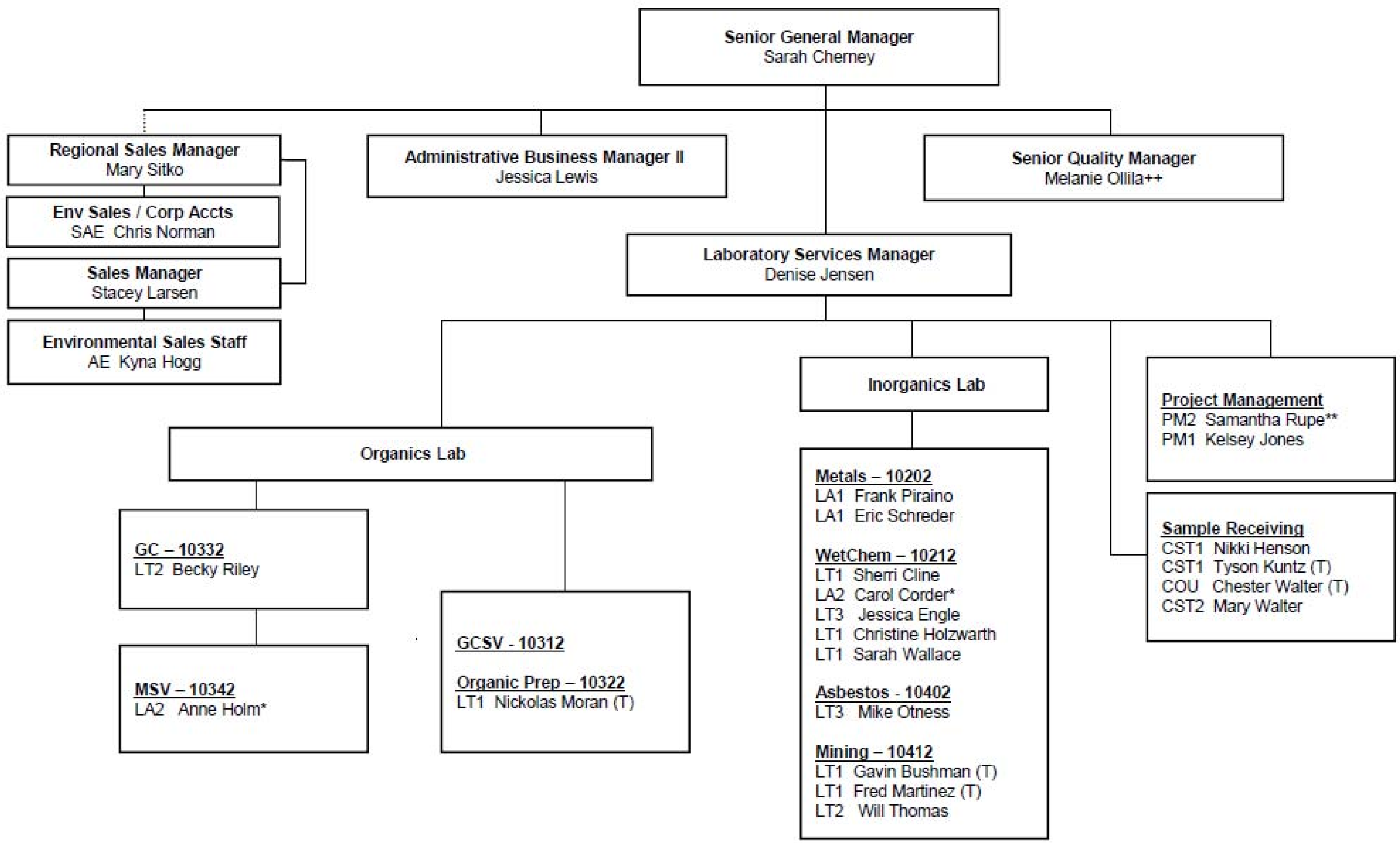
where:
S = Standard Deviation of the data points
$\overline{X}$ = average of all data points

ATTACHMENT IIA- MINNEAPOLIS LABORATORY ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)



ATTACHMENT IIB- MONTANA LABORATORY ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)

Pace Analytical™



Sarah Cherney, General Manager
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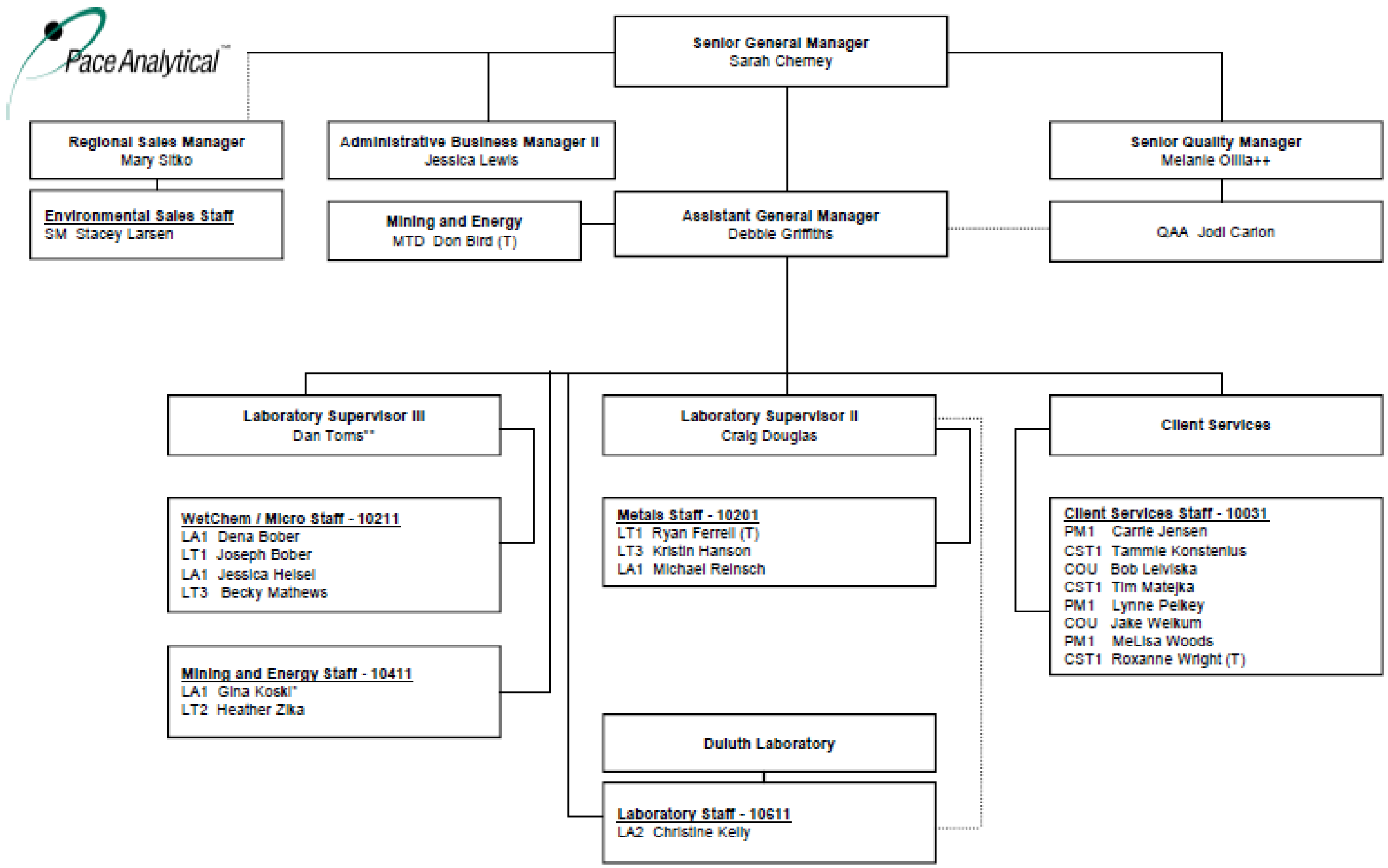
**Safety Officer
(T) Temporary Employee

Billings, Montana Laboratory

ATTACHMENT IIC- VIRGINIA AND DULUTH LABORATORY ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)



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Last Revised: May 29, 2014
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**Safety Officer
****Safety Committee Member*
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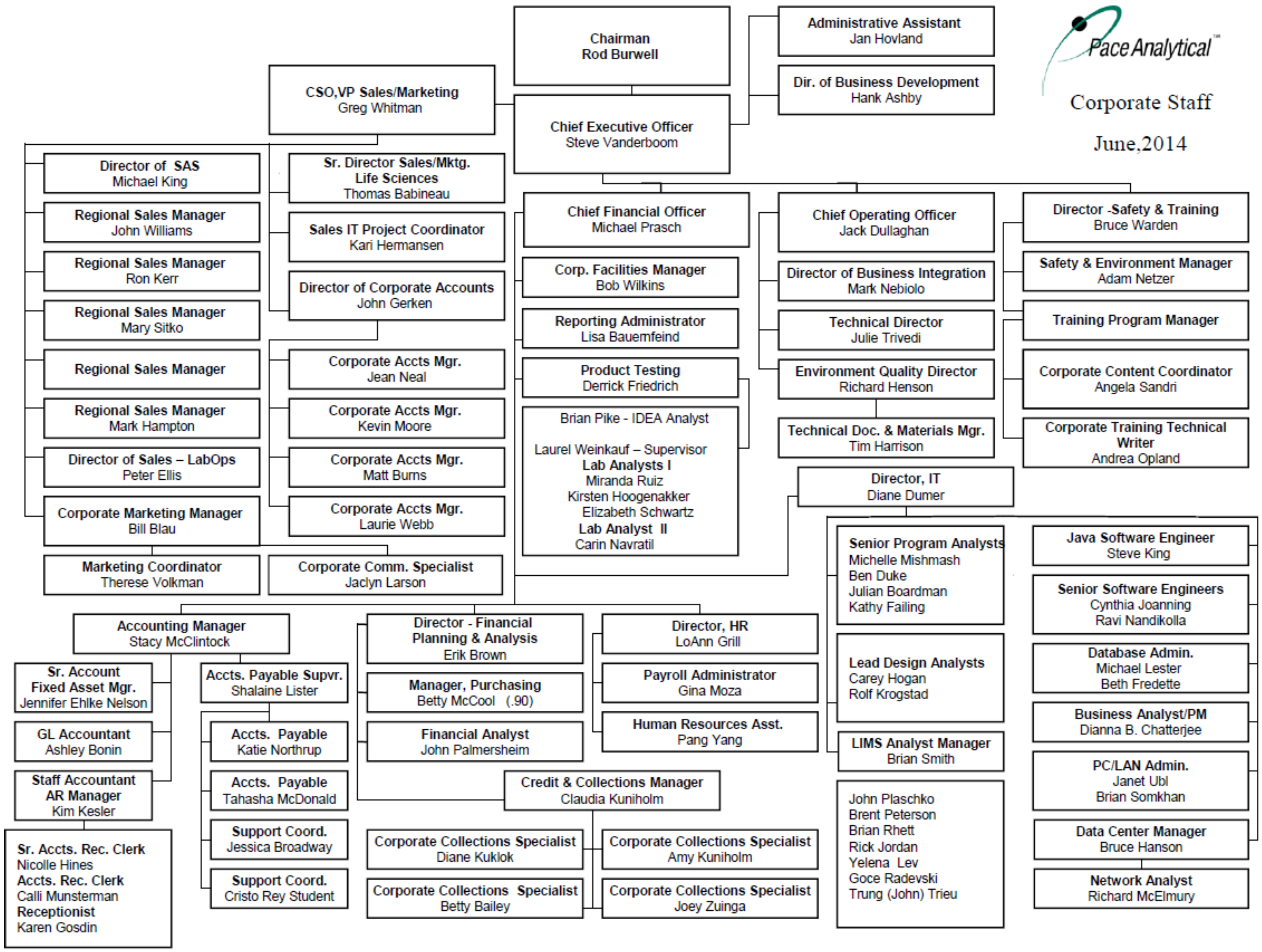
Virginia and Duluth, Minnesota Laboratories

ATTCHMENT IID- CORPORATE ORGANIZATIONAL CHART (CURRENT AS OF ISSUE DATE)



ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST (CURRENT AS OF ISSUE DATE)

DEPT	INSTRUMENT	ID	MANUFACTURER	MODEL	ANALYSIS
Air	GC	10AIR0	Agilent Technologies	6890N	TO-15
Air	MS	10AIR0	Agilent Technologies	5973 Network	TO-15
Air	Concentrator	10AIR0	Entech Instruments, Inc.	7100A	TO-15
Air	GC	10AIR5	HP	5890	3C
Air	GC	10AIR7	Agilent Technologies	6890N	TO-15
Air	MS	10AIR7	Agilent Technologies	5973 Network	TO-15
Air	Concentrator	10AIR7	Entech Instruments, Inc.	7100A	TO-15
Air	GC	10AIR9	Agilent Technologies	G1530A	RSK 175
Air	Headspace Sampler	10AIR9	Agilent Technologies	G1888	RSK 175
Air	GC	10AIRA	ALS Ready	6890A	TO3 BTEX
Air	Concentrator	10AIRA	Entech Instruments, Inc.	7100A	TO3 BTEX
Air	MS	10AIRB	Agilent Technologies	5973 inert	TO-15
Air	GC	10AIRB	Agilent Technologies	6890	TO-15
Air	Concentrator	10AIRB	Markes	Unity2	TO-15
Air	Autosampler	10AIRB	Markes	CIA Advantage/CIA Satellite	TO-15
Air	GC	10AIRD	Agilent Technologies	7890A	TO14/15
Air	MS	10AIRD	Agilent Technologies	5975C	TO14/15
Air	Concentrator	10AIRD	Entech Instruments, Inc.	7100A	TO14/15
Air	Autosampler	10AIRE	Agilent Technologies	7693	TO17
Air	MS	10AIRE	Agilent Technologies	5975C	TO17
Air	GC	10AIRE	Agilent Technologies	7890A	TO17
Air	Thermal Desorber	10AIRE	Perkin Elmer	Turbomatrix 650	TO17
Air	GC	10AIRF	Perkin Elmer	Clarus 680	Method Development
Air	MS	10AIRF	Perkin Elmer	Clarus SQ 8 C	Method Development
Air	Thermal Desorber	10AIRF	PerkinElmer	Turbomatrix 650	Method Development
Air	Canister Autosampler	AIR7T1	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIR7T2	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIRBT1	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIRBT2	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIR0T1	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIR0T3	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIRD	Entech Instruments, Inc.	7016 CA	TO-15
Air	Canister Autosampler	AIRD	Entech Instruments, Inc.	7016 CA	TO-15
Air	Can Cleaning Rack	Rack 1	Pace	na	

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Air	Can Cleaning Rack	Rack 2	Pace	na	
Air	Can Cleaning Rack	Rack 3	Pace	na	
Air	Oven	10AIR10	Despatch	LDB Series	General-Air
Air	Pirani and Diaphragm Gauge	10AIR12	Vacuum Research Corp	902034	
Air	Pirani and Diaphragm Gauge	10AIR13	Vacuum Research Corp	902034	
Air	Pirani and Diaphragm Gauge	10AIR20	Vacuum Research Corp	902034	
Air	Pirani and Diaphragm Gauge	10AIR11	Vacuum Research Corp	902034	
HRMS	GCMS	10MSHR09	Agilent	6890N	1613/8290/Mthd 23,29/TO9/DW
HRMS	GCMS	10MSHR09	Waters/Micromass	Autospec Premier	1613/8290/Mthd 23,29/PCB
HRMS	GCMS	10MSHR06	Agilent	6890A	1613/8290/Mthd 23,29/1614
HRMS	GCMS	10MSHR06	Waters/Micromass	Autospec Ultima	1613/8290/Mthd 23,29
HRMS	GCMS	10MSHR10	Thermo Scientific	Trace GC Ultra	1613 DW
HRMS	GCMS	10MSHR10	Thermo Scientific	Trace GC Ultra	1613 DW
HRMS	GCMS	10MSHR10	Thermo Scientific	DFS High Resolution Magnetic Sector MS	1613 DW
HRMS	GCMS	10MSHR11	Thermo Scientific	Trace GC Ultra	1613 DW
HRMS	GCMS	10MSHR11	Thermo Scientific	Trace GC Ultra	1613 DW
HRMS	GCMS	10MSHR11	Thermo Scientific	DFS High Resolution Magnetic Sector MS	1613 DW
HRMS	GCMS	10MSHR05	Agilent	6890A	1613/8290/Mthd 23,29/DW/PCB
HRMS	GCMS	10MSHR05	Waters/Micromass	Autospec Ultima	1613/8290/Mthd 23,29
Dioxin DW	balance	10BAL1	Denver Inst	MXX-5001	1613
Dioxin Prep	balance	10BAL2	A&D	EK4100i	8290, 1613, 1668, 1614
Dioxin Prep	Micro 100 Turbidimeter	10HR14	Scientific Inc.	Micro 100 Turbidimeter	Turbidity
Dioxin Prep	Microwave	10HR13	CEM	MarsXpress	8290/1613 Solid & wipes, 1668A short list & 209 solids
Dioxin Prep	N-EVAP	N-EVAP 1	Organomation	112	General - HRMS prep
Dioxin Prep	N-EVAP	N-EVAP 2	Organomation	112	General - HRMS prep
Dioxin Prep	N-EVAP	N-EVAP 3	Organomation	112	General - HRMS prep
Dioxin Prep	Accelerated Solvent Extractor	10HR12	ACE	200	General - HRMS prep
Dioxin Prep	N-EVAP	DW1	Organomation	8125	General - HRMS prep
Dioxin Prep	N-EVAP	DW2	Organomation	8125	General - HRMS prep
Dioxin Prep	N-EVAP	N-EVAP 4	Organomation	8125	General - HRMS prep
Dioxin Prep	N-EVAP	N-EVAP 5	Organomation	8125	General - HRMS prep
Dioxin Prep	N-EVAP	N-EVAP 6	Organomation	8125	General - HRMS prep
Dioxin Prep	Oven	DP4	Lindberg Blue	GO1340A-1	General - HRMS prep
Metals	ICPMS	10ICM3	Thermo Scientific	Xseries 2	Metals

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Metals	ICPMS	10ICM4	Thermo Scientific	XII	Metals
Metals	ICPMS	10ICM5	Thermo Scientific	XII	Metals
Metals	ICPMS	10ICM8	Aglient 7700	G3281A	6020, 200.8
Metals	ICPMS	10ICM9	Aglient 7700	G3281A	
Metals	ICP	10ICP2	Perkin Elmer Instruments	Optima 4300 DV	Metals
Metals	ICP	10ICP3	Perkin Elmer Instruments	Optima 4300 DV	Metals
Metals	Mercury Analyzer	10HG3	Cetac Quick Trace	M-7500	Mercury
Metals	Mercury Autosampler	10HG3	ASX-520	MAS Ver w/Diluter	Mercury
Metals	Mercury Analyzer	10HG4	Cetac	M7600	Mercury
Metals	Heat Plate	10MET25	Cole Parmer	HS19 C-P	
Metals	Hot Block	10MET02	Environmental Express	SC154	6010/Mercury/6020/200.8/method 29
Metals	Hot Block	10MET03	Environmental Express	na	6010/Mercury/6020/200.8/method 29
Metals	Hot Block	10MET04	Environmental Express	na	6010/Mercury/6020/200.8/method 29
Metals	Hot Block	10MET05	Thomas Cain Inc.	Deena 60	Metals Prep
Metals	Hot Block	10MET08	Environmental Express	NA	Metals Prep
Metals	Hot Block	10MET09	Environmental Express	NA	Metals Prep
Metals	Hot Block	10MET10	Environmental Express	NA	Metals Prep
Metals	Hot Block	10MET22	Environmental Express	SC154	
Metals	Hot Block	10MET23	Environmental Express	SC154	6010, 6020, 200.7 and 200.8
Metals	Hot Block	10MET26	Environmental Express	SC154	
Metals	Tumbler	10MET06	Associated Design & Mfg. Co.	3740-24**BRE**	TCLP Prep
Metals	Tumbler	10MET20	Environmental Express	na	Metals Prep
Metals	balance	10BALD	Mettler	PM600	various soil methods
Metals	balance	10BAL4	A&D	EK-610i	6010, 200.7, 200.8, 6020, 7470, 7471, 245.1
Metals	balance	10WETD	Mettler-Toledo	PB602-5	6010, 200.7, 200.8, 6020
Metals	balance	10BAL3	Sartorius	BP 110 S	equipment calibrations
Metals	balance	10BAL5	A&D	FX1200i	1311, 1312
O-Prep	UltraSonicator	10OP17	Branson	8510	General - Oprep
O-Prep	Sonicator	10OP01	Misonix	XL 2020	3550
O-Prep	Sonicator	10OP02	Misonix	XL 2015	3550
O-Prep	Sonicator	10OP03	Misonix	Sonicator 3000	3550
O-Prep	Sonicator	10OP04	Misonix	Sonicator 3000	3550
O-Prep	Soxtherm	10OP06	Gerhardt	na	8082
O-Prep	Soxtherm	10OP07	Gerhardt	na	8082

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

O-Prep	Soxtherm	10OP08	Gerhardt	na	8082
O-Prep	Soxtherm	10OP09	Gerhardt	na	8082
O-Prep	N-EVAP	10OP10	Organomation	112	General - Oprep
O-Prep	N-EVAP	10OP11	Organomation	112	General - Oprep
O-Prep	Centrifuge	10OP13	IEC	Centra GP8	General - Oprep
O-Prep	Centrifuge	10OP14	Damon/IEC Division	na	General - Oprep
O-Prep	Centrifuge	10OP15	International Clinical Centrifuge	CL28899M	General - Oprep
O-Prep	balance	10BAL6	A&D	EK-410i	soil prep: AK, 8270, PAH, DRO, 625, 8015, 8081
O-Prep	balance	10BAL7	Denver Inst	MXX-612	soil prep: AK, 8270, PAH, DRO, 625, 8015, 8081
SVOA	GC System	10MSSA	Agilent	7890A	SIM
SVOA	Autosampler Tower	10MSSA	Agilent/HP	7693 Series	SIM
SVOA	Autosampler Tray	10MSSA	Agilent/HP	7693 Series	SIM
SVOA	MS Detector	10MSSA	Agilent/HP	5975C	SIM
SVOA	Peltier Cooling System	10MSSA	Gersel	CIS 4	SIM
SVOA	AutoSampler Tower	10MSSB	Agilent	7863B	SIM, TO13, High Volume Injection
SVOA	GC/Oven	10MSSB	Agilent	7890	SIM, TO13, High Volume Injection
SVOA	MS Detector	10MSSB	Agilent	5975C	SIM, TO13, High Volume Injection
SVOA	AutoSampler Tray	10MSSB	Agilent	7683	SIM, TO13, High Volume Injection
SVOA	Peltier Cooling System	10MSSB	Gersel	CIS 4	SIM, TO13, High Volume Injection
SVOA	GC	10MSSD	Agilent	6890N	8270, PCP SIM
SVOA	MS	10MSSD	Agilent	5975	8270, PCP SIM
SVOA	Autosampler	10MSSD	Agilent	G2614 A	8270, PCP SIM
SVOA	Tower 7683B	10MSSD	Agilent	62915A	8270, PCP SIM
SVOA	MS	10MSS3	HP	5973	CPAH, PCP
SVOA	GC	10MSS3	HP	6890	CPAH, PCP
SVOA	Autosampler Tray	10MSS3	Agilent/HP	7683	CPAH, PCP
SVOA	Injector Tower	10MSS3	Agilent/HP	7683	CPAH, PCP
SVOA	Autosampler Tray	10MSS3	Agilent/HP	7683	CPAH, PCP
SVOA	GC	10MSS6	Agilent	6890N	SIM, PCP
SVOA	Autosampler Tower	10MSS6	Agilent/HP	7683	SIM, PCP
SVOA	MS	10MSS6	Agilent/HP	5973N	SIM, PCP
SVOA	Autosampler Tray	10MSS6	Agilent/HP	7683	SIM, PCP
SVOA	GC	10MSS7	Agilent	6890N	8280
SVOA	Tower 7683	10MSS7	Agilent	62613A	8280
SVOA	Turret 7683	10MSS7	Hewlet Packard	62614A	8280

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

SVOA	Mass Spec 5973	10MSS7	Agilent	62579A	8280
SVOA	AutoSampler Tower	10MSS8	Agilent/HP	7683	Sulfolane, 8270, 625
SVOA	GC/Oven	10MSS8	Agilent	6890 N	Sulfolane, 8270, 625
SVOA	MS Detector	10MSS8	Agilent	5973 N	Sulfolane, 8270, 625
SVOA	AutoSampler Tray	10MSS8	Agilent/HP	7683	Sulfolane, 8270, 625
SVOA	GC/Oven	10MSS9	Agilent	6890 A	8270, 625
SVOA	AutoSampler Tower	10MSS9	Agilent	18593B	8270, 625
SVOA	MS Detector	10MSS9	Agilent	5973 N	8270, 625
SVOA	AutoSampler Tray	10MSS9	Agilent	18596C	8270, 625
SVOA	Dual Microcell ECD	10GCSA	Agilent	6890N	8081
SVOA	Autosampler	10GCSA	Agilent	G2614 A	8081
SVOA	Tower	10GCSB	Agilent	64513A	8081
SVOA	Tray	10GCSB	Agilent	64514A	8081
SVOA	GCECD	10GCSB	Agilent	7890A	8081
SVOA	GC Oven	10GCS4	HP	5890	WIDRO
SVOA	AutoSampler /Tower	10GCS4	HP	7673A	WIDRO
SVOA	AutoSampler Tray	10GCS4	HP	7673A	WIDRO
SVOA	GCECD	10GCS7	Agilent	6890 N	PCB
SVOA	AutoSampler Tray	10GCS7	Agilent/HP	64514A	PCB
SVOA	Tower	10GCS7	HP N279	N279	PCB
SVOA	GC Oven	10GCS8	Agilent	6890 N	8015, NwTPH, AK102, AK103
SVOA	AutoSampler	10GCS8	Agilent/HP	7683	8015, NwTPH, AK102, AK103
SVOA	Tower	10GCS8	Agilent/HP	7683	8015, NwTPH, AK102, AK103
SVOA	GC	10GCS9	Agilent	7890	DRO
SVOA	Tower	10GCS9	Agilent	64513A	DRO
SVOA	Autosampler Tray	10GCS9	Agilent	64514A	DRO
SVOA	GC Oven	10GCSC	Agilent	6890 N	8015, NwTPH, AK102, AK103, WIDRO
SVOA	AutoSampler	10GCSC	Agilent/HP	62614A	8015, NwTPH, AK102, AK103, WIDRO
SVOA	Tower	10GCSC	Agilent/HP	62614A	8015, NwTPH, AK102, AK103, WIDRO
SVOA	balance	10MPR2	Mettler	AE200	Dry Weight Analysis
VOA	AutoSampler	10MSV1	Environmental Sample Tech, Inc.	na	UST, BTEX
VOA	Concentrator	10MSV1	Tekmar	3000	UST, BTEX
VOA	GC	10MSV1	HP	6890	UST, BTEX
VOA	MS	10MSV1	HP	5973	UST, BTEX
VOA	GC	10MSV3	Agilent	6890	8260 Med. Lvl Soil
VOA	AutoSampler	10MSV3	EST Analytical	Centurion	8260 Med. Lvl Soil
VOA	Concentrator	10MSV3	Encon Evolution	na	8260 Med. Lvl Soil

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

VOA	MS	10MSV3	Agilent	5973	8260 Med. Lvl Soil
VOA	AutoSampler	10MSV5	EST Analytical	Centurion	8260/624/TCLP/UST
VOA	Concentrator	10MSV5	Encon Evolution	na	8260/624/TCLP/UST
VOA	GC	10MSV5	HP	6890	8260/624/TCLP/UST
VOA	MS	10MSV5	HP MS	5973	8260/624/TCLP/UST
VOA	AutoSampler	10MSV6	Varian Archon	na	524/8260/624
VOA	Concentrator	10MSV6	Tekmar	3000	524/8260/624
VOA	GC	10MSV6	Agilent	6890A	524/8260/624
VOA	MS	10MSV6	Agilent	5973	524/8260/624
VOA	AutoSampler	10MSV7	Environmental Sample Tech, Inc.	na	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	GC	10MSV7	Agilent Technologies	6850	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	Concentrator	10MSV7	Tekmar	3000	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	MS	10MSV7	Agilent Technologies	5975C	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	GC	10MSV8	5975C	5975C	8260/624/TCLP/UST
VOA	AutoSampler	10MSV8	EST Analytical	Centurion	8260/624/TCLP/UST
VOA	Concentrator	10MSV8	Encon Evolution	na	8260/624/TCLP/UST
VOA	MS	10MSV8	Agilent	5975C	8260/624/TCLP/UST
VOA	Concentrator	10MSV9	Tekmar	14-3100-OEL	8260 - oxygenates
VOA	GC	10MSVA	Agilent	6890	
VOA	MS	10MSVA	Agilent	5973	
VOA	autosampler/concentrator	10MSVA	Tekmar	Atomx 15-0000-100	
VOA	Concentrator	10MSVB	EST	Evolution	
VOA	GC	10MSVC	Agilent	6890N	
VOA	AutoSampler	10MSVC	O-I-Analytical Eclipse	Archon 4552	
VOA	Concentrator	10MSVC	O-I-Analytical Eclipse	4660	
VOA	AutoSampler	10GCV1	Environmental Sample Tech, Inc.	na	
VOA	Concentrator	10GCV1	Tekmar Dohrmann	3100	
VOA	AutoSampler	10GCV3	EST Analytical	Centurion	8021, WIGRO
VOA	Concentrator	10GCV3	Tekmar Dohrmann	3000	8021, WIGRO
VOA	GC	10GCV3	HP	5890 Series II	8021, WIGRO
VOA	AutoSampler	10GCV5	Environmental Sample Tech, Inc.	na	8015/NWTPH-Gx/AK101
VOA	Concentrator	10GCV5	Tekmar	3100	8015/NWTPH-Gx/AK101
VOA	GC	10GCV5	HP	G1530A	8015/NWTPH-Gx/AK101
VOA	AutoSampler	10GCV6	EST Analytical	Archon 8100	8021/8015/GRO/NwTPH
VOA	Concentrator	10GCV6	Tekmar	14-3100-EOL	8021/8015/GRO/NwTPH
VOA	GC	10GCV6	Agilent/HP	HP 6890	8021/8015/GRO/NwTPH

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

VOA	AutoSampler	10GCV7	Environmental Sample Technology	Archon	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	Concentrator	10GCV7	Tekmar 3000	14-3000-000	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	GC	10GCV7	HP	Series II 5890	SIM/8260/624/Low & Med Lvl Soil/TCLP/UST
VOA	AutoSampler	10GCV8	Environmental Sample Technology	Archon	
VOA	Concentrator	10GCV8	Tekmar	3000	
VOA	GC	10GCV8	HP	Series II 5890	
VOA	Oven	10VOA03	Thermo Scientific	NA	General - VOA
VOA	Sonicator	10VOA04	Fisher Scientific	FS220	8260/8021/8015/GRO
VOA	Concentrator	Unassigned	O I Analytical	Eclipse 4660	
VOA	Autosampler	Unassignged	Archon	5100A	
VOA	balance	10BAL9	A&D	FX-3200	
VOA	balance	10BALA	A&D	EK-300i	
VOA	balance	10BALE	Mettler	AE200	
Wet Chem	Incubator	10WET16	Fisher Scientific	Isotemp Incubator	BOD
Wet Chem	Incubator	10WET22	Fisher Scientific	307	BOD
Wet Chem	Incubator	10WET35	Fisher Scientific	307C	BOD
Wet Chem	Incubator	10WET60	Thermo Forma	3940	BOD
Wet Chem	Autotitrator	10WET6	Metrohm	888 Titrando Titrator	Alkalinity SM2320B
Wet Chem	Autosampler	10WET6	Metrohm	778 Sample Processor	Alkalinity SM2320B
Wet Chem	Diss. Oxy Meter	10WET51	YSI	5000	BOD
Wet Chem	Oven	10WET17	Precision Scientific	130 DM	General - Wet Chem
Wet Chem	Oven	10WET20	Fisher Scientific	Isotemp Oven	General - Wet Chem
Wet Chem	AutoClave	10WET29	Harvey	na	General - Wet Chem
Wet Chem	pH Meter	10WET7	Orion	na	pH
Wet Chem	pH Meter	10WET31	IQ Scientific Instruments	na	pH
Wet Chem	Thermoreactor	10WET26	Neutec Group Inc.	ECO 25	COD
Wet Chem	COD Reactor	10WET11	Bioscience, Inc.	na	COD
Wet Chem	KoneLab Discrete Analyzer	10WET3	Thermo Fisher Scientific	Konelab 20	Colormetric - Cl, HexChrom, Cyanide, ophos, NO2, phenol, SO4
Wet Chem	Conductivity meter	10WET9	Oaktom	Con 110 Series	Specific Conductivity
Wet Chem	Colony Counter	10WET30	Gallenkamp	Colony Counter	HPC
Wet Chem	Colony Counter	10WET38	Darkfield Quebec	Colony Counter	HPC
Wet Chem	Water Bath	10WET27	Fisher Scientific	Isotemp 210	General - Wet Chem
Wet Chem	Distillation Block	10WET12	Environmental Express	na	SM4500-P-E
Wet Chem	Distillation Block	10WET13	MIDI-STIL	na	SM4500-P-E

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Wet Chem	Spectrometer	10WETA	Hach	DR 2700	COD
Wet Chem	Hot Plate	10WET34	Presto	Tilt'n Drain Big Griddle	General - Wet Chem
Wet Chem	Smart Chem Discrete Analyzer	10WT36	West Co Scientific Instruments	Smart Chem 200	Colormetric - NH3, NO3, Tphos, cyanide
Wet Chem	Hot Plate	10WET40	Corning	na	General - Wet Chem
Wet Chem	Stir Plate	10WET41	Fisher Scientific	na	General - Wet Chem
Wet Chem	Stir Plate	10WET42	Barnstead/Thermolyne	S46725/Cimarec 2	General - Wet Chem
Wet Chem	Stir Plate	10WET43	Fisher Scientific	na	General - Wet Chem
Wet Chem	Vortex Mixer	10WET44	American Scientific Prod.	S8223-1	General - Wet Chem
Wet Chem	Extractor	10WET45	Horizon Technology	Spe-dex 4790	Oil & Grease
Wet Chem	Extractor	10WET46	Horizon Technology	Spe-dex 4791	Oil & Grease
Wet Chem	Extractor	10WET47	Horizon Technology	Spe-dex 4792	Oil & Grease
Wet Chem	Extractor	10WET48	Horizon Technology	Spe-dex 4793	Oil & Grease
Wet Chem	Closed Cup - Penske	10WT49	Precision Scientific	na	Flash Point
Wet Chem	pH/BOD meter	10WT54	Hach	LBOD10101	BOD
Wet Chem	pH/BOD meter	10WT53	Hach	HQ40d	BOD
Wet Chem	Hot Block	10WET55	Environmental Express	na	COD
Wet Chem	Oven	10WT56	Lindberg/Blue M	MO1450PSA-1	General - Wet Chem
Wet Chem	Oven	10WET65	Fisher Scientific	13-247-650G(6905)	General - Wet Chem
Wet Chem	pH Probe	11662571034	Hach	PHC301	pH
Wet Chem	pH Probe	121952571033	Hach	PHC301	pH
Wet Chem	pH Probe	122143032067	Hach	LBOD101	pH
Wet Chem	pH Probe	712202002	Switchcraft	PHW77-SS	pH
Wet Chem	Turbidity Meter	10WT59	Hach	2100Q	Turbidity
Wet Chem	Hand Held Brix Refractometer	10WT60	Fisher	na	
Wet Chem	Oven	10WET19	VWR Scientific	1370F	General - Wet Chem
Wet Chem	Quanti-Tray Sealer Model 2x	10WET56	Quanti-Tray	89-10894-02	SM9223B
Wet Chem	IC	10WT61	Metrohm	881 Compact IC	EPA Method 300.0
Wet Chem	Lachat	10WT62	Quick Chem	8500	SM4500Cl-E, SM4500P-E, SM3500CrB, EPA 420.4
Wet Chem	Autotitrator	10WT63	Metromn	905 USB Sample Processor	Alkalinity SM2320B
Wet Chem	Fluoride Probe	10WET64	Hanna Instruments	HI 98402	Fluoride
Wet Chem	JT Backer Speedisk Expanded Extration Station	10WET66	J.T. Baker	Speedisk Expanded Extraction Station	
Wet Chem	COD/Cyanide Block (dual reactor, two heat blocks)	10WET67	Hach	DRB 200	COD
Wet Chem	Desiccator	10WET68	Sanplatec Corp	DryKeeper	

ATTACHMENT IIIA- MINNEAPOLIS EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Wet Chem	Desiccator	10WET69	Boekel	na	
Wet Chem	Desiccator	10WET70	Boekel	na	
Wet Chem	Desiccator	10WET71	Boekel	na	
Wet Chem	Desiccator	10WET72	Boekel	na	
Wet Chem	Desiccator	10WET73	Boekel	na	
Wet Chem	Desiccator	10WET74	Boekel	na	
Wet Chem	Desiccator	10WET75	Boekel	na	
Wet Chem	Meter	10WETE	Hach	HQ440d	ph, conductivity, redox
Wet Chem	Oven	10WET77	Fisher Isotemp Oven	6905	General - Wet Chem
Wet Chem	Oven	10WET78	Fisher Isotemp Oven	6905	General - Wet Chem
Wet Chem	balance	10WETB	Sartorius	RC 210 P	9071, 1664
Wet Chem	balance	10BALF	Mettler	AJ100	various
Wet Chem	balance	10BALG	ExplorerPro	EP114C	TSS/TDS
Wet Chem	balance	10BALH	Denver Instrument	MXX-612	various
Wet Chem	balance	10BALB	Ohaus	Scout Pro (SPE 202)	9045, 9071
Wet Chem	balance	10WETC	Sartorius	AC 210 S	TSP, PM10
Wet Chem	balance	10WET4	Mettler-Toledo	AB135-S	2540
Wet Chem	balance	10BALC	Sartorius	LA3200D	humidity cell analysis

ATTACHMENT IIIB- MONTANA EQUIPMENT LIST (CURRENT AS OF ISSUE DATE)

PACE ID	INSTRUMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER
2048	NIST Thermometer	Ertco	-1 to 100 C	2048
2201	NIST Thermometer	ThermoFisher	-1 to 201 C	2201
111877001	NIST Thermometer	Fisher Scientific	15-077-55; 255NK; FB50262	111855001
133	Thermometer			
1065	Thermometer			
3114	Thermometer			
3146	Thermometer			
2348	Thermometer			
5527	Thermometer			
6000	Thermometer			
6578	Thermometer			
7656	Thermometer			
22734	Thermometer			
10344	Thermometer			
Z180878	Thermometer	Extech Instruments	421502	Z180878
14211	Thermometer	Ertco	-30 - 0 °C	14211
14336	Thermometer	Ertco	-30 - 0 °C	14336
80524569	Thermometer			-
20507	Thermometer	Ertco	-30 - 0 °C	20507
1383045	IR Gun	Oakton	InfraPro	1383045
11BAL0 (24353410)	Balance	Denver	MXX-212	24353410
11BAL1 (14138)	Balance	Fisher	7227DA	14138
11MT09 (40020019)	Balance	Sartorius	LC620S	40020019
11MT07 (B027060)	Balance	Fisher	A200DS	B027060
11BAL2 (G3251202300491)	Balance	Ohaus	ARC120	G3251202300491
11BAL3 (E86392)	Balance	Mettler	AE100	E86392
1000062197	2kg Weight	Troemner	2kg	1000062197
6433380081	5mg Weight	Mettler Toledo	5mg	6433380081
01-J54434-46	Weight Set	Denver Instrument	10 gram	01-J54434-46
01-J54881-26	Weight Set	Denver Instrument	50 gram	01-J54881-26
01-J54942-47 and 01-J54223-43	Weight Set	Denver Instrument	1g & 5g	01-J54942-47 and 01-J54223-43
01-J55139-14	Weight Set	Denver Instrument	100 gram	01-J55139-14
18156	Weight Set	Christian Becker		
99-J51026-14	Weight Set	Denver Instrument	500 gram	99-J51026-14
7628	Weight Set	Troemner	50g,2-20g, 10g, 5g, 2-2g	7628
40111	Weight Set	Troemner	100g, 50g, 2-20g, 10g, 5g, 2-2g, 1g, 100mg, .01mg	40111
99-10964	Weight Set	Denver Instrument	50g, 30g, 20g, 10g, 5g, 3g, 2g, 1g	99-10964
1000016506	0.01 g Weight	Troemner	0.01g	1000016506
11MT03	SVOA GC	Hewlett-Packard	5890A	3235A46830
11MT03	Autosampler	Hewlett-Packard	7673	3120A27948

ATTACHMENT IIIB- MONTANA EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

11MT03	Autosampler	Hewlett-Packard	7673	3048A24383
11MT04	Autosampler	Hewlett-Packard	7673	3225A31213
11MT04	Autosampler	Hewlett-Packard	7673	3120A28856
11MT04	SVOA GC	Hewlett-Packard	5890	275A16778
11MT05	IC Autosampler	Dionex	AS40-1	7101378
11MT05	Ion Chromatograph	Dionex	ICS1000	05120175
11MT06	Autoanalyzer Autosampler	Astoria Pacific	311	311162
11MT06	Autoanalyzer Detector	Astoria Pacific	305A	305352
11MT06	Autoanalyzer Heater Unit	Astoria Pacific	303A	303437
11MT06	Autoanalyzer Photometer	Astoria Pacific	350	350376
11MT06	Autoanalyzer Power Supply	Astoria Pacific	304A	304224
11MT06	Autosampler power supply	Perstorp	509	5766
11MT06	Autosampler pump	Perstorp	502	818?5??-212
11MT08	Spectrophotometer	Spectronic	Aquamate	104218
11MT10	Oven	Fisher	Isotemp 255D	1451
11MT11	Oven	Fisher	Isotemp 630F	20900168
11MT12	Muffle Furnace	Sybron	Thermolyne	32400731
11MT13	Concentrator	Zymark	TurboVap II	TB9814N8062
11MT14	Concentrator	Zymark	TurboVap II	4082
11MT15	Furnace	Sybron Thermolyne	1300	0479 16654
11MT16	N-Evap	Organomation	112	11771
11MT17	Waterbath	Northwest Fixtures	I5505	246T
11MT18	pH meter	Fisher	AR50	81207936
11MT19	Sonicator	Fisher	FS60	RUA080390744
11MT20	Centrifuge	Fisher	Centific	406N0169
11MT22	Furnace	Leco	S-144DR	3167
11MT23	Turbidimeter	HF Scientific	Micro 1000	610064
11MT24	Sonicator	Heat Systems	Sonicator XL	Can't read
11MT25	Sonicator	Branson	Sonfier 450	B1090019
11MT28	Microscope*	Olympus	BH-2	217295
11MT29	Microscope*	Olympus	BH-2	230579
11MT30	Stereoscope	Fisher	8711	
11MT31	Steroscope	Olympus	G10X	340704
11MT32	Microscope*	Olympus	BH-2	242833
11MT33	Concentrator	Tekmar/Dohrmann	Tekmar 3000 Purge and Trap concentrator	96312005
11MT33	VOA GC	Aglient	6890	US00009537
11MT33	Autosampler	EST	Centurion	CENT-W-417042312
11MT34	Block Digestor	Lachat	BD-46	1800-733
11MT35	Oven	Precison	NA	603041552
11MT38	AutoSampler	O-I-Analytical	4552	
11MT38	Concentrator	Tekmar Dohrmann	3100	99274012
11MT38	GC System	Agilent	6890	US00032765
11MT38	MS Detector	Agilent	5973	US94240027
11MT39	Thermoreacter	VELP Scientifica	F101A0125	197853
11MT40	pH meter	Accumet	AR50	81207936

ATTACHMENT IIIB- MONTANA EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

11MT41	Oven	Fisher	Isotemp 630F	
11MT42	Oven	Precision Scientific	Thelco 130 DM	9212-016
11MT43	GC System	Agilent	6890	US00021845
11MT43	Concentrator	EST	Evolution	EV431073112
11MT43	AutoSampler	EST	Centurion	CENT-W-416041012
11MT44	Flow Analyzer	Lachat	8500	120400001407
11MT47	Sieve Shaker	Gilson	SS-15	6290
11MT48	Sieve Shaker	W.S. Tyler	RX_29	10-2394
11MT49	Sieve Shaker	Gilson	SS-15	6289
11MT50	Sieve Shaker	Gilson	SS-84	1587
11MT51	Concentrator	Zymark	Turbo Vap II	4254
11MT52	GC System	HP	5890 series 2	336A53379
11MT52	Autoinjectors (2)	HP	7673	3120A27091 & 3249A33250
11MT53	Concentrator	Zymark	TurboVap II	TV1012N15747
11MT54	Ion Chromatograph	Dionex	LC20	10748
11MT54	IC Conductivity Detector	Dionex	CD25	04040488
11MT54	IC Isocratic pump	Dionex	IP25	04030145
11MT55	Custom Shaker	Custom	NA	NA
11MT56	Oven	Fisher516G		801N0068
11MT57	Autoclave	ThermoFisher	ST75925	1277081210300
11MT58	Metals Block Digester	Environmental Express	Hot Block	S388CEC2479
11MT59	UV VIS Spectophotometer	Varian	Cary50BIO	EL98033269
11MT60	ICP	ThermoFisher	ICAP6500 Duo	20071505
11MT60	Autosampler	CETAC	ASX-520	71011378
11MT60	Chiller	ThermoFisher	ThermoFlex900	51520175
11MT61	Centrifuge	Damon	IEC HN-S	34721368
11MT62	Block Digestor	Lachat	BD-46	1800-296
11MT64	Handheld pH	Thermo Scientific	Star A121	H00013
11MT65	Spectrophotometer	Thermo Scientific	Evolution 201	5A4S008017
FSA4	Autopipette	Hamilton	1000 uL Adj. Vol.	078490
FSA5	Autopipette	Hamilton	999 uL Adj. Vol.	078778
FSA6	Autopipette	Hamilton	300 uL Adj. Vol.	078528
IN-1103 - WC4	Autopipette	Oxford	1000-5000uL	E02008781
IN-1104 - IC2	Autopipette	Eppendorf	500-2000uL	4609456
IN-1106 - IC3	Autopipette	Gilson	50-2000uL	Z54657M
WC2	Autopipette	Eppendorf	0.1-1mL	4035876
WC3	Autopipette	Eppendorf	0.1-1mL	4038286
WC6	Autopipette	Eppendorf	20-200uL	4078539
WC7	Autopipette	Finnpipette	1-10mL	GJ45632
WC5	Autopipette	Hamilton	1-101-10mL	33269
MET1	Autopipette	Hamilton	.05-.3mL	80395
MET2	Autopipette	Hamilton	0.1-1mL	80953
IC4	Autopipette	Hamilton	0.1-1mL	81405
IC5	Autopipette	Finnpipette	0.5-5mL	KH11148
N/A	Pulverizer	Retsch	RS100	

ATTACHMENT IIIB- MONTANA EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

N/A	Vacuum Pump	Edwards	E2M2	41032
N/A	Vacuum Pump	Dayton	SA55NXGTB-4142	E22922
DocuTemp	Automated Temperature Monitoring System	DocuTemp	2.0.365	

*All microscopes cleaned 10-25-10

ATTACHMENT IIIC- VIRGINIA EQUIPMENT LIST (CURRENT AS OF ISSUE DATE)

DESCRIPTION	MANUFACTURER	MODEL #/SN#
CVAA Mercury Analyzer	Cetac	M-6100/060402 QT6
Autosampler	Cetac	ASX-400/070401 ASX-4
Hardware	Venture Systemax	SYX PHM800PRO/106381144
Software	Cetac	Quicktrace Hg Analyzer System Version 1.2.1
Graphite Furnace AA	Perkin Elmer	A/S 800/8444
Autosampler	Perkin Elmer	ASX 520 / 090511A520-06
FIAS 400 Hydride Chemifold	Perkin Elmer	400511051103
Hardware	Dell	Optiplex GX1/06UQ4
Software	Perkin Elmer	AA Winlab Instrument Control Software Ver3.9
ICP Atomic Emission Spectrometer	Perkin Elmer	Optima 3000XL/069N4081202
Autosampler	Cetac	ASX-520/090511A520-new in 2006
Hardware	Compudyne	X86 Model 7/4747
Software	Perkin Elmer	Winlab 32 ICP Optical Emission Software Ver2.2
ICPMS Atomic Emission Spectrometer	Perkin Elmer	ELAN 9000 / AJ11920712
Autosampler/Pump	Perkin Elmer	S10/102S8010517
Recirculator	Polyscience	NA
Software	Perkin Elmer	Version 3.4
Hardware	Dell XP	X12-51522
Lachat	Zellweger Analytics	Lachat Quikchem FIA+ 8000 Series/A83000-1480
Lachat Reagent Pump	Zellweger Analytics	RP-150 Series/A82000-1527 replacement 2005
Autosampler	Cetac	ASX-500 Model No 510/109932ASX
Autodilutor	Zellweger Analytics	8000 Series/A81010-277 Out of service ~2002
Micro Distillation Equipment (Ammonia)	Lachat MicroDist 5/09	081200001033
Block Digester	Lachat	BD-46/1800-408
Hardware	Midwest Comp Depot	3035
Software	Omnion	FIA Data System
Ion Chromatograph 12WTA2	Metrohm	861 Advanced Compact IC/48614011
Regenerant Dispenser	Metrohm	None
Autosampler	Metrohm	Model 838 Advanced Sample Processor
Hardware	Dell	SN#CBDUC284-70821-553-OGIP
Software	Metrohm	IC Net 2.3
Ion Chromatograph 12WTA7	Metrohm	Model 881 Advanced Compact IC 1881000122119
Regenerant Dispenser	Metrohm	800 Dosino
Autosampler	Metrohm	Model 858 Advanced Sample Processor
Hardware	Dell	Optiplex 790
Software	Metrohm	IC Net 2.3
BOD Warmer #1	Thermo Precision	60541072
BOD Incubator #1	VWR	Model 2020/09065105
BOD Incubator #2	VWR	Model 2020/0902090

ATTACHMENT IIIC- VIRGINIA EQUIPMENT LIST CONTINUED (CURRENT AS OF ISSUE DATE)

BOD Incubator #3	VWR	Model 2020/2107705
BOD Reader	Thermo Electron Corp	BOD Auto EZ BOD Reader 10060020/A0074
BOD Hardware	Hewlett Packard/Compaq	24A41601N8
BOD Software	Thermosystems	BOD Auto EZ 2001
TOC 12WTA3	OI Analyzer	SN H129732449E
TOC	OI Autosampler	SN E129788451
TOC	OI Solids Analyzer	SN A129733824
Autosampling Module	OI Corporation	No Model/621290637-92120
IR Detector	OI Corporation	No Model/2A0002T
Hardware	HP	Compaq
Software	OI Corporation	V1.4.2
TOC 12WTA8	OI Analyzer	SN P407730312P
Autosampling Module	OI Corporation	Model 1088 AS
IR Detector	OI Corporation	Model 1030
Hardware	Lenovo	Thinkcentre
Software	OI Corporation	1.4.2
Drying Oven 1996	Blue M	OV-18C
Furnace 2005	Barnstead/Thermolyne	62700/BT010507A
Solids Balance	ADA	71/L/AE04260556
Hardware 2004	ABS	52X MTRP/10085322
Software 2004	EZ Solids	EZ_Solids Program June 23, 2004
Expandable Ion Analyzer	Orion	940/6673
Autosampler	Orion	AS 3000/B0019
Bacteria Incubator	Shel Lab / New 3/07	1545/11052906
Coliform Incubator Bath	ThermoFisher/New 4/07	253/SN202682-185
Microscope 10X/30X	National Optical/New 2/07	446TBL-10
Bacteria Incubator	Shel Lab 1996 (Sterility chk)	1520
Quanti Tray Sealer	IDEXX	89-10894-02 4788
Oven 2005	VWR	1330GM/05039804
Oven	TEMPCON	P10734
Water Bath	Fisher Scientific	FS140/FS010507
Metals Digestion Blocks (HB1; HB2)	CPI	05-C0530/000424 1005-CPI ModBlock Inst
Balance (Metals) 12BAL3	AND	GF 1200 / 10318953
Balance	Sartorius	LA 3200D / 13407528
Balance	Sartorius	Genius / 13003773
Stir Plate	Thermoline Type 7200	903971255007
Refrigerator 2R (Metals)	Sanyo	SR-362OK/051105496-new 6/30/06
Refrigerator #3	True Mfg Co.	T-49/1-2953805
Refrigerator #5	True Mfg Co.	T-49/1-3060851
Refrigerator #8	True Mfg Co	T-35/I-3016399
Refrigerator #10	Gibson	NTS Fridge #10 at 526 NTS
Refrigerator #12	Beverage-Air	9029136/KR481AS
Refrigerator #13	US Cooler Walk-in	29716
Mixer	Thermolyne	M37615/376950140798
Stir/Hotplate	VWR	12365-392 / 050914023

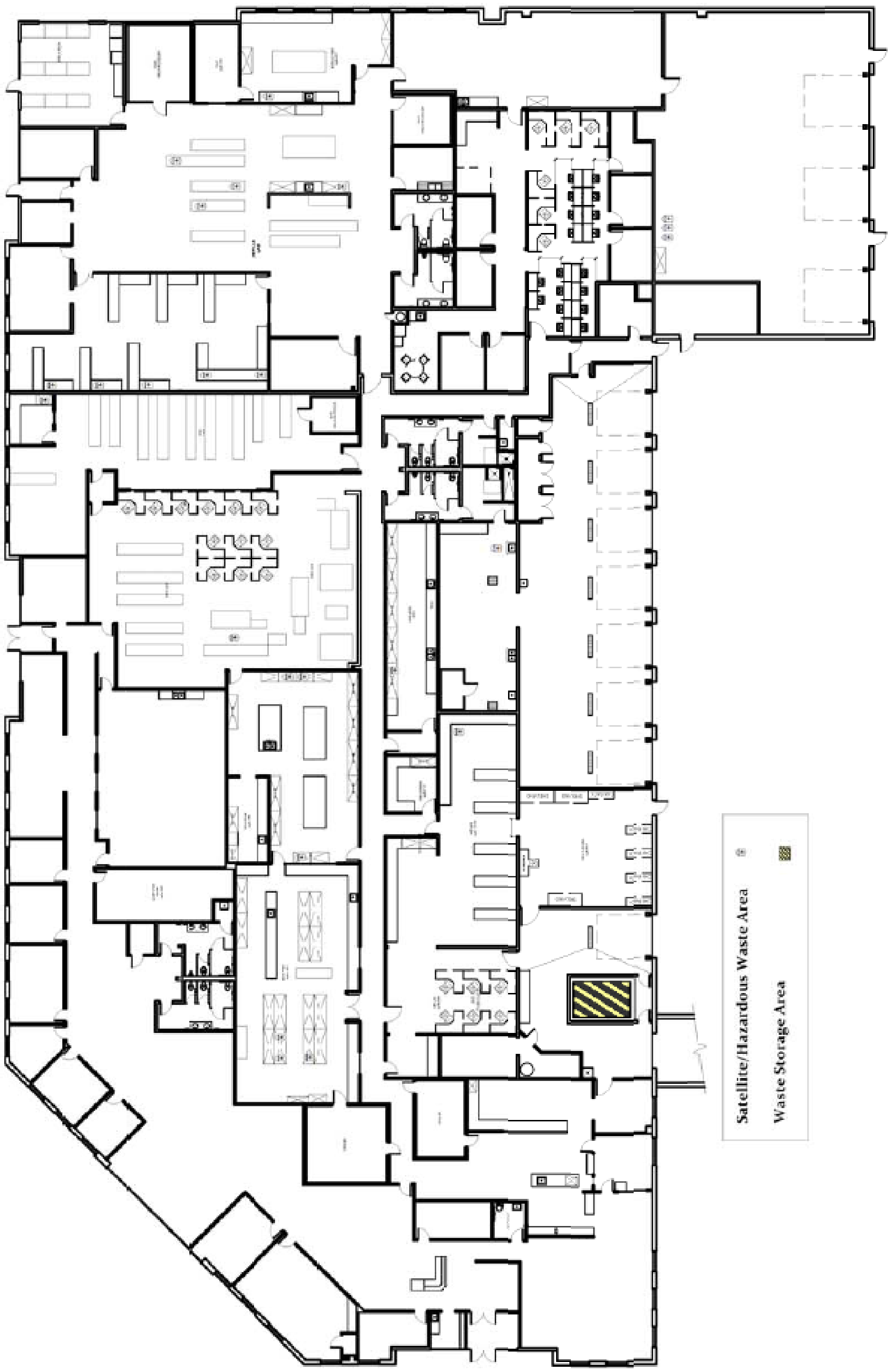
ATTACHMENT IIIC- VIRGINIA EQUIPMENT LIST CONTINUED
(CURRENT AS OF ISSUE DATE)

COD Reactor-Hot block	HACH	45600-00/920600007477
COD Reactor- Hot block	HACH	16500-10/5944
Dessicator	Labconco	55300/171400
Dessicator	Labconco	55300/232878
Mixer	Fisher Scientific	Model 15/103
Rotator	Lab-Line	Model 1345/1002-1791
Balance Extraction/Solids	Acculab	VI 600/027UC1079
Autoclave	Tuttnauer/Brinkmann	3545EP
pH Meter	Orion	550A / 016948
Turbidimeter 12WET4	HF Scientific	39957 / 10621
Dissolved Oxygen Meter	YSI	5100
BOD Software	YSI	5120 BODANALYST
Spectrophotometer	HACH	DR 5000
Water Purification System, DI	Barnstead	E-Pure
Water Purification System, RO pure LP Low pressure RO System	Barnstead Thermolyne	Model D2622 SN 496000209600 Cartridge Changes noted in log book
Resistivity Meter for RO system	Sybron Barnstead	Model 02770 Resistivity Log Sheet is posted by system

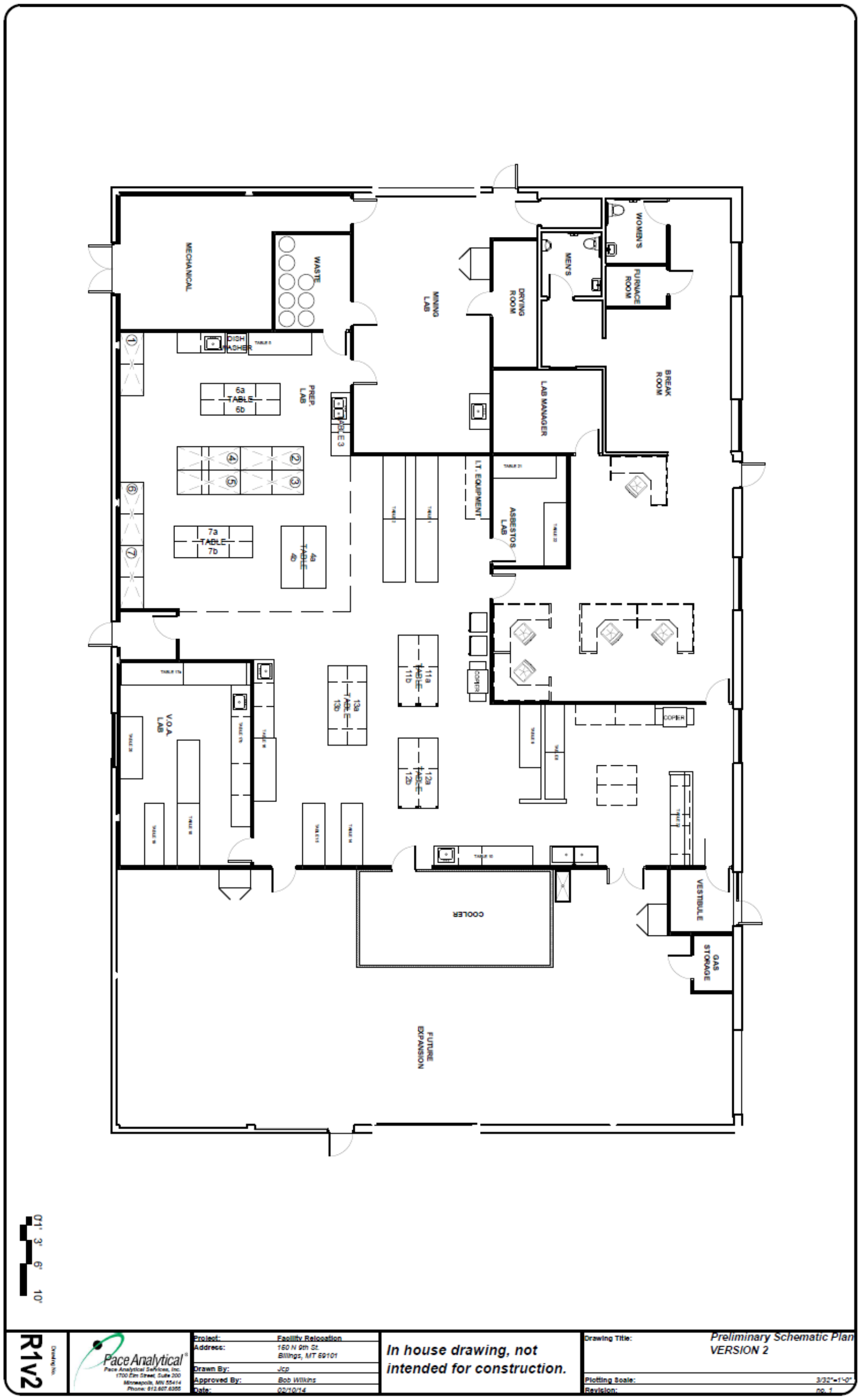
ATTACHMENT IIID- DULUTH EQUIPMENT LIST (CURRENT AS OF ISSUE DATE)

DESCRIPTION	MANUFACTURER	MODEL #/SN#
Water Purification System	Barnstead D4641	1090090938202
Refrigerator D-1	Admiral	LTS2112ARW
Refrigerator D-2	Estate Whirlpool	TT18AK
Mercury Analyzer CVAFS	Brooks Rand Model III	11026201
Autosampler	Brooks Rand PS	4936A14632
Total Hg Purge and Trap	Brooks Rand Merx	11078001
Hg Speciation Purge and Trap	Brooks Rand Merx	41107301
Hardware	XPRO Systems	
Software	Mercury Guru	4.1
Balance	Sartorius ME14145	13003775
Hood DB-1	Esco	04ESC
Hood DB-2	Esco	04ESC
Hood 3 DE-1 Perchloric Acid Hood	Labconco	
Bacteria Incubator	Thermco Precision	605031678

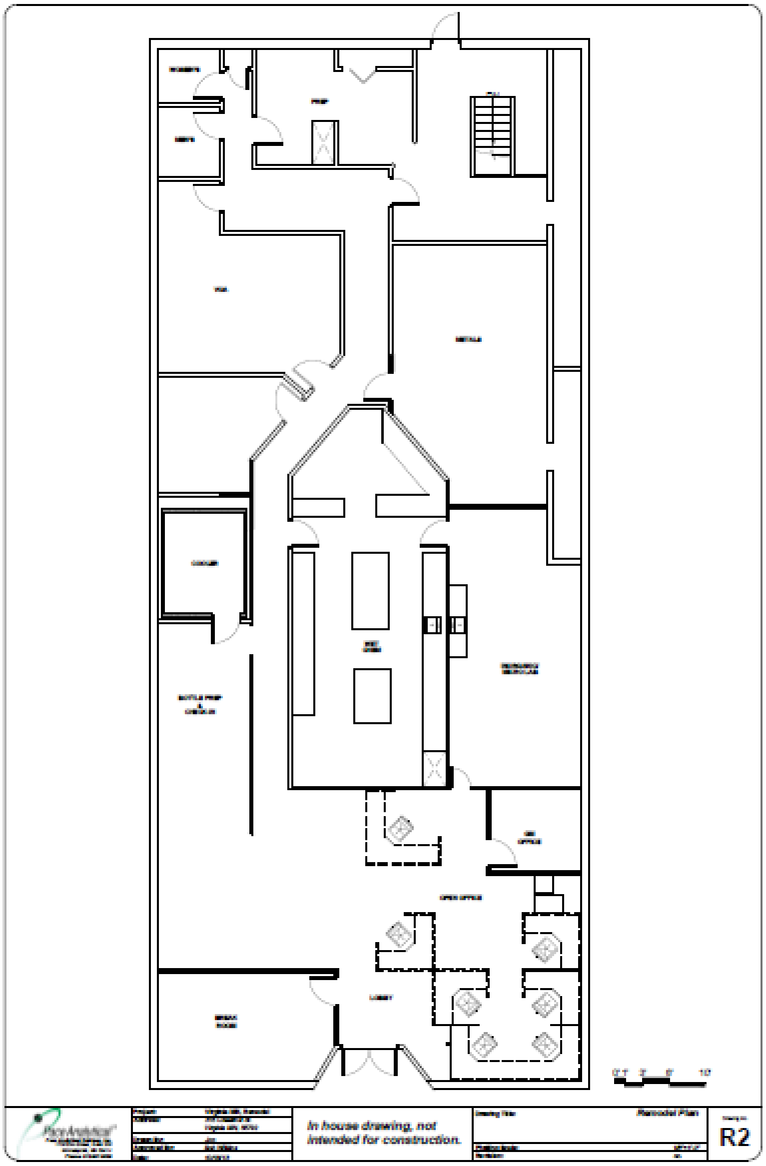
ATTACHMENT IVA- MINNEAPOLIS LABORATORY FLOOR PLAN (CURRENT AS OF ISSUE DATE)



ATTACHMENT IVB- MONTANA LABORATORY FLOOR PLAN (CURRENT AS OF ISSUE DATE)



ATTACHMENT IVC- VIRGINIA LABORATORY FLOOR PLANS (CURRENT AS OF ISSUE DATE)



ATTACHMENT VA- MINNEAPOLIS SOP LIST (CURRENT AS OF ISSUE DATE)

Title	SOP Number
Determination of Methane, Ethane, and Ethene in Air Modified TO-3	S-MN-A-002
Analysis of Air Samples for Volatile Organic Compounds by Gas Chromatography/PID-FID method TO-3	S-MN-A-003
Cleaning, Certification, Leak Checking and Preparation for Shipment of SUMMA Passivated Canisters	S-MN-A-004
Determination of Fixed Gases in Air by Modified 3C	S-MN-A-005
Methane, Ethane, Ethene, and Propane in Water by GCFID mod. 3810 and RSK 175	S-MN-A-007
Analysis of Whole Air Sample for Volatile Organic Compound by GC/MS EPA TO15/TO14	S-MN-A-013
Determination of Hydrocarbons in Air using Radiello Passive Sample Tubes	S-MN-A-017
Analysis of TO17 Active Air Samples	S-MN-A-018
Analysis of BTEX and PAHs in Whole Air Using Thermal Desorption Tubes and GC/MS	S-MN-A-019
The Determination OF Hydrocarbons in Air Samples via RAD145 RADIELLO® Passive Sample Tubes	S-MN-A-020
Sample Management	S-MN-C-001
Bottle Preparatation	S-MN-C-003
Subcontracting Samples	S-MN-C-004
Internal Chain of Custody	S-MN-C-005
Percent Solids (Moisture)	S-MN-I-367
The Determination of Specific Aromatic Compounds and Gasoline Range Organic in Water and Soils	S-MN-O-427
Purgeable Total Petroleum Hydrocarbons in Water (8015 Mod / CA LUFT)	S-MN-O-525
Purgeable Total Petroleum Hydrocarbons in Water (NWTPH)	S-MN-O-555
Determination of Gasoline Range Organices by Method AK101	S-MN-O-556
Volatiles Water Sample Compositing Procedure	S-MN-O-541
Analysis of Polychlorinated Biphenyls in Oil, Soil, Water, Wipe and Air Matrixes	S-MN-O-432
Determination of Diesel Range Organics in Water and Soil (Wisconsin modified DRO)	S-MN-O-466
Ethylene glycol, Propylene Glycol, Triethylene Glycol by Modified 8015	S-MN-O-533
Saturated Hydrocarbons (Alkanes/Isoprenoids Compounds) and Total Extractable Hydrocarbons	S-MN-O-567
Determination of Pesticides in Water and Soil	S-MN-O-574
Determination of EDB and DBCP in Aqueous Samples	S-MN-O-576
The Determination of Diesel Range Organics, Residual Range Organics and Total Extractable Hydrocarbons	S-MN-O-578
Preparation and Analysis of Samples for the Determination of Dioxins and Furans by USEPA Method 8290/8290A	S-MN-H-001
Preparation and Analysis of Samples for the Determination of 2,3,7,8-TCDD using USEPA Method 1613B, Drinking Water	S-MN-H-003
Preparation and Analysis of Samples for the Determination of PCDDs, PCDFs, and PCBs by modified USEPA Method 23, TO9, or NY State Guidelines	S-MN-H-005
Method 1668, PCB Congenger (WHO List)	S-MN-H-009
Preparation and Analysis of Samples for the Determination of Dioxins and Furans by 8280M	S-MN-H-013
Preparation and Analysis of Samples for the Determination of Chlorinated Biphenyl Congeners	S-MN-H-014
Preparation and Analysis of Samples for the Determination of Polybrominated Diphenyl Ether Congeners	S-MN-H-016
TCLP/SPLP	S-MN-I-312

ATTACHMENT VA- MINNEAPOLIS SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Inductively Coupled Plasma Atomic Emission Spectroscopy (RCRA)	S-MN-I-313
Hardness by Calculation	S-MN-I-338
Mercury in Liquid and Solid/Semis-Solid Waste	S-MN-I-359
Digest Procedure for Aqueous Samples to be Analyzed by Induct Coupled Plasma (SW-846)	S-MN-I-458
Metals Preparation for Solid samples, Wipes and Filters	S-MN-I-460
Metals Analysis by ICP/MS - Method 6020 and 200.8	S-MN-I-492
Preparation of Aqueous Samples for ICPMS Analysis	S-MN-I-523
Extractable Base/Neutral and Acid Organic Compounds in Liquid, Solid, and TCLP Matrices by Gas Chromatography/Mass Spectrometry Capillary Column Technique	S-MN-O-436
8270-L Extractable Base/Neutral and Acid Organic Compounds in Water and Liquid Matrices by GC/MS Capillary Column Technique w/Selective Ion Monitoring	S-MN-O-507
Extractable Base/Neutral and Acid Organic Compounds in Liquid by EPA Method 625	S-MN-O-532
Determination of Parent and Alkylated PAH Compounds in Solid and Liquid Matrices by GC/MS SIM	S-MN-O-561
Analysis of Air samples by GC/MS - Method TO-13	S-MN-O-534
Sulfolane Extraction and Analysis in Liquid Matrices by GCMS	S-MN-O-569
High Volume Injection for 8270C SIM	S-MN-O-570
Analysis of Volatile Organic Compounds by GC/MS Method 8260	S-MN-O-521
Analysis of Volatile Organic Compounds by GC/MS Method 624	S-MN-O-529
Analysis of Volatile Organic Compounds in Water Method 524.2	S-MN-O-546
Method For Sonicator Tuning	S-MN-O-414
Cleaning Glassware in the Organic Laboratory	S-MN-O-465
Sonication Extraction Technique for Base/Neutral and Acid Compounds (3550C Modified)	S-MN-O-495
Continuous Liquid-Liquid Extraction (SW3520) for Base/Neutral and Acid Compounds	S-MN-O-496
Spike Verification in the Organic Prep Lab	S-MN-O-497
Preparation of Anhydrous Sodium Sulfate for Extraction Purposes	S-MN-O-500
Nitrogen Evaporation Technique	S-MN-O-503
Sample Concentration Technique	S-MN-O-504
Separatory Funnel Extraction for Polyaromatic Hydrocarbons by 8270-SIM	S-MN-O-506
Solvent Exchange into Hexane	S-MN-O-509
Continuous Liq/Liq extraction for Method 8270C (Dual pH) by SW 3520C	S-MN-O-539
Soil Extraction for PAH Analysis by GC/MS:SIM (3550C)	S-MN-O-540
Separatory Funnel Extraction	S-MN-O-566
Data Archiving and Retrieval	S-MN-L-106
Reagent Water Quality	S-MN-L-110
Generation of EDD	S-MN-L-112
Preventative, Routine, and Non-routine Maintenance	S-MN-L-114
Receipt and Storage of Laboratory Supplies	S-MN-L-117
Data Review Process	S-MN-L-132
Syringe Technique	S-MN-L-139

ATTACHMENT VA- MINNEAPOLIS SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

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Purchasing Laboratory Supplies	S-MN-L-143
Laboratory Housekeeping	S-MN-L-145
Sample Homogenization and Sub-Sampling	S-MN-L-147
Quality Manual	17.1
Control Chart Generation and Trend Analysis	S-MN-Q-205
Manual Integration	S-MN-Q-214
Control of Hazardous Energy Program - Lockout/Tagout	S-MN-Q-249
Method Validation and Modification Studies	S-MN-Q-252
Procedure for Handling of USDA regulated soils	S-MN-Q-253
Estimation of Measurement Uncertainty	S-MN-Q-255
Management of Change	S-MN-Q-257
Proficiency Testing Program	S-MN-Q-258
Evaluation and Qualification of Vendors	S-MN-Q-259
Use of A2LA Terms and Symbols	S-MN-Q-260
Conflict of Interest Plan	S-MN-Q-261
Corrective and Preventative Actions	S-MN-Q-262
Monitoring Temperature Controlled Units	S-MN-Q-263
Support Equipment	S-MN-Q-264
Document Control and Management	S-MN-Q-268
Determination of Limit of Detection and Limit of Quantitation	S-MN-Q-269
Review of Analytical Requests	S-MN-Q-270
Internal and External Audits	S-MN-Q-271
MCL Violation Reporting	S-MN-Q-272
Preparation of Standard Operating Procedures	S-MN-Q-273
Spreadsheet Validation	S-MN-Q-274
Standard and Reagent Management and Traceability	S-MN-Q-275
Use of the Pacelink System	S-MN-Q-276
Chemical Hygiene Plan/Safety Manual	S-MN-S-001
Waste Management Training Requirements	S-MN-S-002
Waste Handling and Management	S-MN-S-003
MN Contingency Plan	2014
Air Quality Monitoring and Fume Hood Monitoring	S-MN-S-004
Biochemical Oxygen Demand (BOD) and Carbonaceous Biochemical Oxygen Demand (CBOD)	S-MN-I-348
Determination of Hexane Extractable material (HEM) and Silica Gel Treated – Hexane Extractable Material (SGT-HEM) in Solids	S-MN-I-357
Hexavalent Chromium in Water and Wastewater	S-MN-I-358
Alkalinity, Titrimetric	S-MN-I-365
Fluoride in Water and Wastewater	S-MN-I-470

ATTACHMENT VA- MINNEAPOLIS SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Determination of Total Phosphorus in Aqueous Samples by SmartChem	S-MN-I-473
Specific Conductivity	S-MN-I-474
Ortho Phosphorus in Water by the Konelab, Ascorbic Acid Method	S-MN-I-477
Settleable Solids	S-MN-I-486
Standard Test Method for Screening Apparent Specific Gravity and Bulk Density Waste	S-MN-I-493
Determination of Total Recoverable Phenolics by Flow Injection Colorimetry	S-MN-I-494
Turbidity	S-MN-I-501
Chlorine, Total Residual in Water	S-MN-I-502
Use and Maintenance of the Konelab	S-MN-I-507
Determination of Nitrate/Nitrite in Surface and Wastewater by SmartChem Colorimetric Analysis	S-MN-I-508
Determination of Chloride by Konelab	S-MN-I-509
Determination of Sulfate by Konelab	S-MN-I-510
Determination of Nitrite by Konelab (Spectrophotometric Method)	S-MN-I-514
Paint Filter Liquids Test	S-MN-I-516
Determination of Hexane Extractable material (HEM) and Silica Gel Treated – Hexane Extractable Material (SGT-HEM) in Water	S-MN-I-520
Dissolved Oxygen	S-MN-I-524
Measurement of pH in Water, Soil, and Waste	S-MN-I-526
Determination of TSP and PM 10	S-MN-I-527
Measurement of Solids in Water and Wastewater	S-MN-I-528
Total CN in Water - Macro Distillation	S-MN-I-529
Weak Acid Disociable Cyanide in Water - Macro Distillation	S-MN-I-530
Total Coliform Bacteria	S-MN-MB-001
Fecal Coliform by MF	S-MN-MB-002
Heterotrophic Plate Count	S-MN-MB-003
Total Coliform Bacteria by Membrane Filtration	S-MN-MB-005
Sample Container Sterility Verification	S-MN-MB-006
Total Coliform Bacteria and E. Coliform Bacteria	S-MN-MB-007
The Determination of Ammonia by SmartChem	S-MN-I-559
Determination of NO3/NO2 by SmartChem	S-MN-I-560
Data Correctness Calculations	S-MN-I-562
COD by Hach 2700	S-MN-I-563
Total Recoverable Cyanide and Amenable Cyanide in Water	S-MN-I-564
Delta Airlines Anodizing Line	S-MN-I-582
Determination of Inorganic Anions by Ion Chromatography	S-MN-I-583
Determination of Nitrate/Nitrite on the Lachat by Cadmium Reduction	S-MN-I-584
Determination of Sulfate on the Lachat	S-MN-I-585
Sample Appearance	S-MN-I-586
Net Acid Generation (NAG)	S-MN-I-589

ATTACHMENT VA- MINNEAPOLIS SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Humidity Cells	S-MN-I-590
Determination of Phenolic Compounds by Flow Injection Analysis Colorimetry	S-MN-I-591
Determination of Chloride by Flow Injection Analysis Colormetry	S-MN-I-592
Determination of Ortho Phosphate in Waters by Flow Injection Analysis Colorimetry	S-MN-I-593
Determination of Hexavalent Chromium by Flow Injection Analysis	S-MN-I-594
Drierite Regeneration Procedure	S-MN-O-557
Bottle Order Database	S-ALL-C-002
Operation of Paceport Customer Feedback Form	S-ALL-C-005
Document Numbering	S-ALL-Q-003
EPIC PRO: Acode Addition/Modification	S-ALL-Q-008
Laboratory Documentation	S-ALL-Q-009
Quarterly Quality Report	S-ALL-Q-014
Review of Laboratory Management System	S-ALL-Q-015
Training Procedures	S-ALL-Q-020
3P Program: CIP	S-ALL-Q-022
Use and Operation of Lab Track System	S-ALL-Q-028
Mint Miner Data File Review	S-ALL-Q-029
Operation of Data Checker For Epic Pro	S-ALL-Q-030
Data Recall	S-ALL-Q-035
Processing Tentatively Identified Compounds (TICS) for GC/MS	S-ALL-O-038
Hazard Assessments	S-ALL-S-001
LMS Sub-Learn Center System and Training Administrator Responsibilities	S-ALL-T-002
Anonymous Hotline Procedure	S-COR-Q-034

ATTACHMENT VB- MONTANA SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Title	SOP Number
Microscope Adjustment - Phase Contrast	S-MT-ASB-015
Microscope Alignment - Polarized Light Microscope	S-MT-ASB-016
Bulk Analysis Using Polarized Light Microscopy	S-MT-ASB-023
Asbestos Data Review	S-MT-ASB-026
Fiber Counts By NIOSH 7400 Using Excel Spreadsheet	S-MT-ASB-027
Quality Control for Asbestos Analysis	S-MT-ASB-028
The Determination of Extractable Petroleum Hydrocarbons by Method MA-EPH	S-MT-O-001
Petroleum Hydrocarbons as Diesel in Water and Soil	S-MT-O-002
Purgeable Total Petroleum Hydrocarbons in Water and Soil	S-MT-O-003
Volatile Petroleum Hydrocarbons (VPH)	S-MT-O-005
Coarse Fragment	S-MT-ME-035
Acid-Base Accounting - Sobek	S-MT-ME-004
pH Paste	S-MT-ME-006
Soil Sieve for Black Eagle	S-MT-ME-017
Organic Matter	S-MT-ME-001
Available Nitrate and Ammonia	S-MT-ME-022
Particle Size Analysis	S-MT-ME-024
Volatile Organic Compounds by 8260B	S-MT-O-004
Preparation of Anhydrous Sodium Sulfate for Extraction Purposes	S-MT-O-008
Referencing NVLAP Accreditation	S-MT-Q-001
MT Contingency plan	2014
Waste Handling and Management	S-MT-S-001
Nitrite by SM4500 NO2B	S-MT-I-036
Acidity	S-MT-I-032
Turbidity	S-MT-I-034
Phosphorus, Ortho and Total	S-MT-I-002
Sulfides	S-MT-I-005
Specific Conductivity SW2510B	S-MT-I-007
Measurement of Solids in Water and Wastewater	S-MT-I-008
The Determination of Nitrate-Nitrite by Flow Analyzer	S-MT-I-009
TKN By Colorimetry	S-MT-I-010
Total Sufur by LECO	S-MT-ME-012
Water Soluble Sulfate and Chloride	S-MT-I-013
The Determination of Percent Moisture in Soil and Solid Samples	S-MT-I-014
Determination of Inorganic Anions by Ion Chromatography	S-MT-I-018
Determination of Ammonia Nitrogen by Automated Phenate	S-MT-I-019
Chlorophyll-a	S-MT-I-020

ATTACHMENT VB- MONTANA SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Measurement of pH in Water, Soil, and Waste	S-MT-I-021
Determination of Oxidation-Reduction Potential in Water	S-MT-I-029
Settleable Solids	S-MT-I-030
Determination of Dissolved Oxygen	S-MT-I-031
Multi Increment Soil Sampling	S-MT-I-033
Soil Agronmy Metals Extraction Procedures	S-MT-M-032
Inductively Coupled Plasma Atomic Emission Spectroscropy	S-MT-M-033

ATTACHMENT VC- VIRGINIA SOP LIST (CURRENT AS OF ISSUE DATE)

Title	SOP Number
Sample Management	S-VM-C-001
Bottle Preparation	S-VM-C-002
Subcontracting Samples	S-VM-C-003
Alkalinity, Titrimetric (Automated Titration)	S-VM-I-002
Acidity Titration Method	S-VM-I-003
Conductivity	S-VM-I-005
Turbidity	S-VM-I-006
Color	S-VM-I-007
Total Residual Chlorine	S-VM-I-008
Chlorine Automated Ferricyanide Method	S-VM-I-009
pH	S-VM-I-010
Measurement of Solids in Water and Wastewater	S-VM-I-011
Determination of Hexavalent Chrome by Colorimetric Analysis	S-VM-I-012
Determination of Phosphorus by Automated Colorimetry	S-VM-I-013
Determination of Orthophosphate by Colorimetry	S-VM-I-014
Ammonia-Nitrogen by Semi-Automated Colorimetry	S-VM-I-015
Total Kjeldahl Nitrogen by Semi-Automated Colorimetry	S-VM-I-016
Nitrogen, NO3+NO2 and NO2 by EPA 353.2 Colorimetric, Automated	S-VM-I-017
Determination of Anions by Ion Chromatography	S-VM-I-018
Total Organic Carbon and Dissolved Organic Carbon	S-VM-I-019
Determination of Chemical Oxygen Demand in Water, Wastewater and Industrial Wastes Using the Hach Spectrophotometer	S-VM-I-020
Biochemical Oxygen Demand and Carbonaceous Biochemical Oxygen Demand	S-VM-I-021
Total and Fecal Coliform Bacteria Membrane Filter	S-VM-I-022
Total Coliform Bacteria	S-VM-I-023
Heterotropic Plate Count Simplate Procedure	S-VM-I-024
Sample Container Sterility Verification	S-VM-I-025
Total Coliform Bacteria and E Coliform Bacteria	S-VM-I-026
Chlorophyll A	S-VM-I-027
Formaldehyde	S-VM-I-028
The Determination of Cation Anion Balance	S-VM-I-029
Determination of Percent Total Solids	S-VM-I-031
Total Amine Analysis in Water by Spectrometry	S-VM-I-032
Total Sulfide, Iodometric Titration	S-VM-I-033
The Determination of Oxidation Reduction Potential (ORP)	S-VM-I-034
Determination of Metals by Inductively Coupled Plasma (ICP) Spectroscopy	S-VM-M-001
Mercury in Liquid and Solid/Semi-Solid Waste	S-VM-M-004
Metals Analysis by ICP/MS	S-VM-M-006

ATTACHMENT VC- VIRGINIA SOP LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Determination of Selenium, Total and Speciated, in Liquid and Soil by Hydride Generation	S-VM-M-008
The Determination of Moisture, Ash, and Organic Matter of Peat and Other Organic Soils (Mining)	S-VM-MIN-001
Size Analysis Using Sieves (Mining)	S-VM-MIN-002
Mechanical Hydrometer / Grain Size Analysis (Mining)	S-VM-MIN-003
Filtering Slurry Samples for Metals Analysis (Mining)	S-VM-MIN-004
Digestion of Samples for Metals Analysis ASTM E507-93(Mining)	S-VM-MIN-005
Digestion of Samples for Metals Analysis Internal Digestion Method(Mining)	S-VM-MIN-006
The Pulverization of Ore and Solid Matrices (Mining)	S-VM-MIN-007
Atterberg Limits (Mining)	S-VM-MIN-008
Determination of Ferrous Iron in D.R.I. Iron Ore and Concentrates Dichromate Method Manual Titration (Mining)	S-VM-MIN-010
Flashpoint: Closed Cup (Mining)	S-VM-MIN-011
Visual Soil Classification (Mining)	S-VM-MIN-012
Moisture in the Analysis Sample of Coal and Coke (Mining)	S-VM-MIN-013

ATTACHMENT VD- DULUTH SOP LIST (CURRENT AS OF ISSUE DATE)

Title	SOP Number
Mercury Analysis by Cold Vapor Atomic Fluorescence Spectrometry	S-VM-M-003
Methyl Mercury Analysis by Aqueous Ethylation, Purge and Trap GC with CVAFS Detection	S-VM-M-007
Mercury Analysis by Cold Vapor Atomic Fluorescence Spectrometry of Solid Samples	S-VM-M-010

ATTACHMENT VIA- MINNEAPOLIS CERTIFICATION LIST (CURRENT AS OF ISSUE DATE) SCOPE AND APPLICATION CERTIFICATES ARE MAINTAINED AND FILED IN THE LOCAL QUALITY DEPARTMENT

EPA ID: MN00064				
State	**Agency**	**Program**	**Cert #**	**Expiration**
A2LA	A2LA	DW – Dioxin, WW, HZ; Envi – WW. HZ; Air; DOD	2926.01	10/31/2015
Alabama	Dept of Environmental Mgmt	Dioxin - DW	40770	12/31/2014
Alaska	Dept. of Environmental Conservation	Contaminated Sites (6010B, 6020, 8260B, PCBs, PAHs)	UST-078	8/10/2014
Alaska	Dept. of Environmental Conservation	Dioxin - DW	MN00064	6/30/2014
Arizona	Dept of Health Services	Dioxin/Envi -DW, WW, HW; Air	AZ0014	12/14/2014
Arkansas	Dept of Environmental Quality	Dioxins/Env	88-0680	6/19/2014
California	Dept of Health Services	Dioxin/Envi -DW, WW, HW	01155CA	8/31/2014
Colorado	Dept. of Public Health & Environment	Dioxins/Envi – DW	Pace Analytical	12/31/2014
Connecticut	Dept of Public Health	Dioxin/Envi -DW, WW, HW	PH-0256	12/31/2014
EPA Region 8 - Wyhoming	Water Division	Dioxins/Envi – DW	8TMS	12/31/2014
Florida (NELAP)	Dept of Health Services	Dioxin/Envi -DW, WW, HW; Air	E87605	6/30/2014
Georgia	Environmental Protection Division	Dioxin/Envi - WW, HW	Pace	12/31/2014
Georgia	Dept of Natural Resources	Dioxin - DW	959	12/31/2014
Guam	Guam EPA	Dioxin - DW	Pace Analytical	10/21/2014
Idaho	Dept. of Health & Welfare	Dioxins/Envi – DW	MN00064	12/31/2014
Hawaii	Dept of Health	Dioxins/Envi – DW	MN00064	12/31/2014
Illinois	Illinois EPA	Dioxin/Envi - DW, HW, WW	200011	12/11/2014
Indiana	Dept of Health	Dioxin - DW	C-MN-01	12/31/2014
Iowa	Dept.of Natural Resources	Dioxin - DW	368	6/1/2015
Kansas	Dept of Health and Environment	Dioxin/Envi - DW, WW, HW	E-10167	10/31/2014
Kentucky	Dept of Environmental Protection	Dioxin – DW	90062	12/31/2014
Kentucky	Dept of Environmental Protection	Dioxin – WW	90062	12/31/2014
Louisiana DEQ	Department of Environmental Quality	Dioxin/Envi - WW, HW; Air	3086	6/30/2014
Louisiana DHH	Department of Health and Hospitals	Dioxin – DW	LA140001	12/31/2014
Maine	Dept of Human Services	Dioxin/Envi - DW	2013011	5/27/2015
Maryland	Dept. of Heath and Mental Hygiene	Dioxin/Envi - DW	322	6/30/2015
Michigan	Dept. of Public Health	Dioxin/Envi - DW	9909	12/31/2014
Minnesota	Dept of Health	Envi - DW, WW, HW	027-053-137	12/31/2014
Minnesota	Department of Commerce	Petrofund	1240	4/16/2014

ATTACHMENT VIA- MINNEAPOLIS CERTIFICATION LIST CONTINUED (CURRENT AS OF ISSUE DATE)

Mississippi	Dept. of Health and Environmental Control	Dioxin - DW	Pace	12/31/2014
Montana	Dept of Health	Dioxin/Envi - DW	92	1/1/2015
Nebraska	Dept. of Health & Human Services.	Dioxin /Envi - DW	Pace	12/31/2014
Nevada	Health Division	Dioxin/Envi - DW, WW, HW	MN_00064_2000_72	7/31/2014
New Jersey	Dept of Environmental Protection	Dioxin/Envi - DW, WW, HW	MN002	6/30/2014
New York	Dept of Health	Dioxin - DW, WW, Air	11647	4/1/2015
North Carolina	Dept of Environment, Health and Natural Resources	Envir - WW, HW	530	12/31/2014
North Carolina	State Public Health Laboratory	Dioxin - DW	27700	7/31/2014
North Dakota	Dept of Health and Consolidated Labs	Dioxin/Envi - DW, WW, HW	R-036	12/31/2014
Ohio	Ohio EPA	Dioxin - DW	4150	12/31/2014
Ohio Vap	VAP	Air	CL101	1/29/2016
Oklahoma	Dept of Environmental Quality	Dioxin/Envi - DW	9507	8/31/2014
Oregon	ELAP	Dioxin - DW, WW, HW; Air	MN200001-005	8/14/2015
Oregon	ELAP	NwTPH	MN300001-001	5/25/2015
Pennsylvania	Dept of Environmental Protection	Dioxin/Envi - DW, WW, HW	68-00563	3/31/2015
Puerto Rico	Departamento de Salud	Dioxin /Envi – DW		1/30/2015
Saipan (CNMI)	Div. Of Environmental Quality	Dioxin - DW	MP0003	12/31/2014
South Carolina	Dept. of Health and Environmental Control	Dioxin - DW, WW, HW	74003001	12/31/2014
Texas	Department of Health	Dioxin/Envi -DW, WW, HW; Air	T104704192	2/28/2015
Tennessee	Dept of Health	Dioxin/Envi -DW	TN02818	12/31/2014
Utah	Department of Health	Dioxin/Envi - DW, WW, HW	MN00064	6/30/2014
Virginia	Dept of General Services	Dioxin- DW	251	6/30/2014
Virginia - ELAP	VELAP	Dioxin/Envi - DW, WW, HW	460163	6/14/2015
Washington	Dept of Ecology	Dioxin/Envi -DW, WW, HW; Air	C486	2/18/2015
Wisconsin	Dept of Natural Resources	Dioxin/Envi - DW, WW, HW	999407970	8/31/2014
Wyoming	Via EPA Region 8	Dioxin/Envir - DW	8TMS-L	12/31/2014
West Virginia	Dept of Env. Protection	Envi/Dioxin - HW, WW	382	8/31/2014
West Virginia	Dept of Health and Human Resources	Dioxin - DW	9952C	12/31/2014

ATTACHMENT VIB- MONTANA CERTIFICATION LIST (CURRENT AS OF ISSUE DATE)

EPA ID: MT00012				
State	**Agency**	**Program**	**Cert #**	**Expiration**
A2LA	A2LA	Envi – DW, WW. HZ	2926.01	10/31/2015
Colorado	Dept. of Public Health & Environment	Asbestos Registration	17119	3/15/2015
EPA Region 8	Water Division	DW	8TMS-L	12/31/2014
Idaho	Dept. of Health & Welfare	DW	MT00012	12/31/2014
Minnesota	Dept of Health	Envi-DW, WW	11610AA	12/31/2014
Montana	Dept of Health	DW	40	12/31/2015
North Dakota	Dept of Health and Consolidated Labs	Envi-DW, WW, HW	R-209	12/31/2014
NVLAP	NVLAP	Asbestos	101292-0	3/31/2015
Washington	Dept. of Ecology	DW, NPW,SCM	C993	11/15/2014

ATTACHMENT VIC-VIRGINIA CERTIFICATION LIST (CURRENT AS OF ISSUE DATE)

EPA ID: MN01084				
State	**Agency**	**Program**	**Cert #**	**Expiration**
Alaska	Dept. of Environmental Conservation	Contaminated Sites (6010B, 6020)	UST-078	8/10/2014
Alaska	Dept. of Environmental Conservation	DW	MN01084	6/30/2014
Arizona	Dept. of Health Services	Envi-DW, WW, HW (TOC)	AZ0785	9/9/2014
Minnesota	Dept. of Health	Envi-DW, WW, HW	027-137-445	12/31/2014
North Dakota	Dept. of Health	Envi-DW, WW, HW	R-203	12/31/2014
Washington	Dept. of Ecology	WW, HZ - TOC	C1007	3/23/2015
Wiscousin	Dept. of Natural Resources	Envi-WW, HW	998027470	8/31/2014

ATTACHMENT VID- DULUTH CERTIFICATION LIST (CURRENT AS OF ISSUE DATE)

EPA ID: MN01085				
State	**Agency**	**Program**	**Cert #**	**Expiration**
Minnesota	Dept. of Health	Dioxin-WW; Micro-SDW	027-137-446	12/31/2014
Wisconsin	Dept. of Natural Resources	Envi-WW (Hg)	399066580	8/31/2014

ATTACHMENT VII- PACE CHAIN-OF-CUSTODY (CURRENT AS OF ISSUE DATE)

Pace Analytical™
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A **Required** Client Information:	Section B **Required** Project Information:	Section C Invoice Information:
Company:	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER ________

Site Location

STATE: ________

Requested Analysis Filtered (Y/N)

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes	MATRIX / CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	↓Analysis Test↓ Y/N												Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1																															
2																															
3																															
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: **DATE Signed (MM/DD/YY):**

ATTACHMENT VIII- METHOD HOLD TIME, CONTAINER AND PRESERVATION GUIDE (CURRENT AS OF ISSUE DATE)

THE HOLDING TIME INDICATED IN THE CHART BELOW IS THE MAXIMUM ALLOWABLE TIME FROM COLLECTION TO EXTRACTION AND/OR ANALYSIS PER THE ANALYTICAL METHOD. FOR METHODS THAT REQUIRE PROCESSING PRIOR TO ANALYSIS, THE HOLDING TIME IS DESIGNATED AS 'PREPARATION HOLDING TIME/ANALYSIS HOLDING TIME'.

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Acidity	SM2310B	Water	Plastic/Glass	$\leq 6^oC$	14 Days	
Actinides	HASL-300	Water		pH<2 HNO_3	180 Days	
Actinides	HASL-300	Solid		None	180 Days	
Alkalinity	SM2320B/310.2	Water	Plastic/Glass	$\leq 6^oC$	14 Days	
Alkylated PAHs		Water		$\leq 6^oC$; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved	Yes
Alkylated PAHs		Solid		$\leq 10^oC$	1 Year/40 Days	
Total Alpha Radium (see note 3)	9315/903.0	Water	Plastic/Glass	pH<2 HNO_3	180 days	
Total Alpha Radium (see note 3)	9315	Solid		None	180 days	
Anions (Br, Cl, F, NO_2, NO_3, o-Phos, SO_4 , bromate, chlorite, chlorate)	300.0/300.1/SM 4110B	Water	Plastic/Glass	$\leq 6^oC$; EDA if bromate or chlorite run	All analytes 28 days except: NO_2, NO_3, o-Phos (48 Hours); chlorite (immediately for 300.0; 14 Days for 300.1). NO_2/NO_3 combo 28 days.	Yes
Anions (Br, Cl, F, NO_2, NO_3, o-Phos, SO_4 , bromate, chlorite, chlorate)	300.0	Solid	Plastic/Glass	$\leq 6^oC$	All analytes 28 days except: NO_2, NO_3, o-Phos (48 hours); chlorite (immediately). NO_2/NO_3 combo 28 days.	
Anions (Br, Cl, F, NO_2, NO_3, o-Phos, SO_4	9056	Water/ Solid	Plastic/Glass	$\leq 6^oC$	28 days	
Aromatic and Halogenated Volatiles (see note 1)	8021	Solid	5035 vial kit	See note 1	14 days	Yes
Aromatic and Halogenated Volatiles	602/8021	Water	40mL vials	pH<2 HCl; $\leq 6^oC$; $Na_2S_2O_3$ if Cl present	14 Days (7 Days for aromatics if unpreserved)	
Acid Volatile Sulfide	Draft EPA 1629	Solid	8oz Glass	$\leq 6^oC$	14 Days	
Bacteria, Total Plate Count	SM9221D	Water	Plastic/WK	$\leq 6^oC$; $Na_2S_2O_3$	24 Hours	Yes
Base/Neutrals and Acids	8270	Solid	8oz Glass	$\leq 6^oC$	14/40 Days	

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Base/Neutrals and Acids	625/8270	Water	1L Amber Glass	$\leq$ 6°C; $Na_2S_2O_3$ if Cl present	7/40 Days	Yes
Base/Neutrals, Acids & Pesticides	525.2	Water	1L Amber Glass	pH<2 HCl; $\leq$ 6°C; Na sulfite if Cl present	14/30 Days	Yes
Biomarkers		Water	$\leq$ 6°C; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved	$\leq$ 6°C; pH<2 1:1 HCl (optional)	Yes
Biomarkers		Solid	$\leq$ 10°C	1 Year/40 Days	$\leq$ 10°C	
BOD/cBOD	SM5210B	Water	Plastic/Glass	$\leq$ 6°C	48 hours	Yes
BTEX/Total Hydrocarbons	TO-3	Air	Summa Canister	None	14 Days	
BTEX/Total Hydrocarbons	TO-3	Air	Tedlar Bag or equivalent	None	48 Hours	
Carbamates	531.1	Water	Glass	$Na_2S_2O_3$, Monochloroacetic acid pH <3; $\leq$ 6°C	28 Days	
Cation/Anion Balance	SM1030E	Water	Plastic/Glass	None	None	
Cation Exchange	9081	Solid	8oz Glass	None	unknown	
Chloride	SM4500Cl-C,E	Water	Plastic/Glass	None	28 Days	Yes
Chlorine, Residual	SM4500Cl-D,E,G/330.5/Hach 8167	Water	Plastic/Glass	None	15 minutes	
Chlorophyll	SM10200H	Water	Opaque bottle or aluminum foil	$\leq$ 6°C	48 Hours to filtration	
COD	SM5220C, D/410.4/Hach 8000	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq$ 6°C	28 Days	Yes
Coliform, Fecal	SM9222D	Water	100mL Plastic	$\leq$ 6°C	8 Hours	
Coliform, Fecal	SM9222D	Solid	100mL Plastic	$\leq$ 6°C	8 Hours	
Coliform, Fecal	SM9221E	Water	100mL Plastic	$\leq$ 6°C	8 Hours	
Coliform, Fecal	SM9221E	Solid	100mL Plastic	$\leq$ 6°C	24 Hours	
Coliform, Total	SM9222B	Water	100mL Plastic	$\leq$ 6°C	8 Hours	
Coliform, Total	SM9221B	Solid	100mL Plastic	$\leq$ 6°C	8 Hours	
Coliform, Total and E. coli	SM9223B	Drinking Water	100mL Plastic	$\leq$ 10°C	30 Hours after collection	
Color	SM2120B,E	Water	Covered Plastic/Acid Washed Amber Glass	$\leq$ 6°C	24 Hours	
Condensable Particulate Emissions	EPA 202	Air	Solutions	None	180 Days	
Cyanide, Reactive	SW846 chap.7	Water	Plastic/Glass	None	28 Days	
Cyanide, Reactive	SW846 chap.7	Solid	Plastic/Glass	None	28 Days	
Cyanide, Total and	SM4500CN-	Water	Plastic/Glass	pH$\geq$12 NaOH;	14 Days	Yes

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Amenable	A,B,C,D,E,G,I, N/9010/ 9012/335.4			$\leq 6^oC$; ascorbic acid if Cl present	(24 Hours if sulfide present- applies to SM4500CN only)	
Diesel Range Organics- Alaska DRO	AK102	Solid	8oz Glass	$\leq 6^oC$	14/40 Days	
Diesel Range Organics- Alaska DRO	AK102	Water	1L Glass	pH<2 HCl; $\leq 6^oC$	14/40 Days	Yes
Diesel Range Organics- TPH DRO	8015	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Diesel Range Organics- TPH DRO	8015	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days	Yes
Diesel Range Organics- TPH DRO	8015	Tissue	1L Amber Glass	$\leq$ - 10^oC	1 Year if frozen/40 Days	
Diesel Range Organics- NwTPH-Dx	Nw-TPH-Dx	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Diesel Range Organics- NwTPH-Dx	Nw-TPH-Dx	Water	250mL Amber Glass	pH <2 HCl; $\leq 6^oC$	14/40 Days; 7 Days from collection to extraction if unpreserved	Yes
Diesel Range Organics- Wisconsin DRO	WI MOD DRO	Solid	Tared 4oz Glass Jar	$\leq 6^oC$	10/47 Days	
Diesel Range Organics- Wisconsin DRO	WI MOD DRO	Water	1L Amber Glass	$\leq 6^oC$; pH <2 HCl	14/40 Days	Yes
Dioxins and Furans	1613B	Solid	8oz Glass	$\leq 6^oC$	1 year	Yes
Dioxins and Furans	1613B	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	1 year	
Dioxins and Furans	1613B	Fish/ Tissue	Aluminum foil	$\leq 6^oC$	1 year	
Dioxins and Furans	8290	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	30/45 Days	Yes
Dioxins and Furans	8290	Solid	8oz Glass	$\leq 6^oC$	30/45 Days	Yes
Dioxins and Furans	8290	Fish/ Tissue	Not specified	< -10^oC	30/45 Days	
Dioxins and Furans	TO-9	Air	PUF	None	30/45 Days	
Diquat/Paraquat	549.2	Water	Amber Plastic	$\leq 6^oC$; $Na_2S_2O_3$	7/21 Days	
EDB/DBCP (8011) EDB/DBCP/1,2,3-TCP (504.1)	504.1/8011	Water	40mL vials	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	14 Days	Yes
Endothall	548.1	Water	Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$	7/14 Days	
Enterococci	EPA 1600	Water	100mL Plastic	$\leq 6^oC$	8 Hours	
Explosives	8330/8332	Water	1L Amber Glass	$\leq 6^oC$	7/40 Days	Yes
Explosives	8330/8332	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Extractable Petroleum Hydrocarbons (aliphatic and aromatic)	MA-EPH	Water	1L Amber Glass	pH<2 HCl; $\leq 6^oC$	14/40 Days	
Extractable Petroleum Hydrocarbons (aliphatic and aromatic)	MA-EPH	Solid	4oz Glass Jar	$\leq 6^oC$	7/40 Days	
Fecal Streptococci	SM9230B	Water	100mL Plastic	$\leq 6^oC$	8 Hours	
Ferrous Iron	SN3500Fe-D; Hach 8146	Water	Glass	None	Immediate	
Flashpoint/ Ignitability	1010	Liquid	Plastic/Glass	None	28 Days	
Florida PRO	FL PRO DEP (11/1/95)	Liquid	Glass, PTFE lined cap	$\leq 6^oC$; pH <2 H_2SO_4 or HCl	7/40 Days	
Fluoride	SM4500Fl-C,D	Water	Plastic	None	28 Days	Yes
Gamma Emitting Radionuclides	901.1	Water	Plastic/Glass	pH<2 HNO_3	180 days	
Gasoline Range Organics	8015	Water	40mL vials	pH<2 HCl	14 Days	Yes
Gasoline Range Organics	8015	Solid	5035 vial kit	See note 1	14 days	
Gasoline Range Organics- Alaska GRO	AK101	Solid	5035 vial kit	See 5035 note*	28 Days if GRO only (14 Days with BTEX)	Yes
Gasoline Range Organics- Alaska GRO	AK101	Water	40mL vials	pH<2 HCl; $\leq 6^oC$	14 Days	Yes
Gasoline Range Organics- NwTPH-Gx	Nw-TPH-Gx	Water	40mL vials	pH<2 HCl; $\leq 6^oC$	7 Days unpreserved; 14 Days preserved	Yes
Gasoline Range Organics- NwTPH-Gx	Nw-TPH-Gx	Solid	40mL vials	$\leq 6^oC$; packed jars with no headspace	14 Days	Yes
Gasoline Range Organics- Wisconsin GRO	WI MOD GRO	Water	40mL vials	pH<2 HCl; $\leq 6^oC$	14 Days	
Gasoline Range Organics- Wisconsin GRO	WI MOD GRO	Solid	40mL MeOH vials	$\leq 6^oC$ in MeOH	21 Days	
Glyphosate	547	Water	Glass	$\leq 6^oC$; $Na_2S_2O_3$	14 Days (18 Months frozen)	
Gross Alpha (NJ 48Hr Method)	NJAC 7:18-6	Water	Plastic/Glass	pH<2 HNO_3	48 Hrs	
Gross Alpha and Gross Beta	9310/900.0	Water	Plastic/Glass	pH<2 HNO_3	180 Days	
Gross Alpha and Gross Beta	9310	Solid	Glass	None	180 Days	

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Haloacetic Acids	552.1/552.2	Water	40mL Amber vials	NH_4Cl; $\leq 6^oC$	14/7 Days if extracts stored $\leq 6^oC$ or 14/14 Days if extracts stored at $\leq -10^oC$	Yes
Hardness, Total ($CaCO_3$)	SM2340B,C/ 130.1	Water	Plastic/Glass	pH<2 HNO_3	6 Months	
Heterotrophic Plate Count (SPC/HPC)	SM9215B	Water	100mL Plastic	$\leq 6^oC$	24 Hours	
Heterotrophic Plate Count (SPC/HPC)	SimPlate	Water	100mL Plastic	$\leq 6^oC$	8 Hours	
Herbicides, Chlorinated	8151	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Herbicides, Chlorinated	8151	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days	Yes
Herbicides, Chlorinated	515.1/515.3	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	14/28 Days	Yes
Hexavalent Chromium	7196/218.6/ SM3500Cr-B, C, D	Water	Plastic/Glass	$\leq 6^oC$	24 Hours (see note 4)	Yes
Hexavalent Chromium	7196/218.6/ SM3500Cr-B, C, D	Water	Plastic/Glass	Ammonium Buffer pH 9.3-9.7	28 Days (see note 4)	Yes
Hexavalent Chromium	218.6/218.7	Drinking Water	Plastic/Glass	Ammonium Buffer pH >8	14 Days (see note 4)	
Hexavalent Chromium	7196 (with 3060A)	Solid		$\leq 6^oC$	24 Hours after extraction	
Hydrogen Halide and Halogen Emissions	EPA 26	Air	Solutions	None	6 Months	
Ignitability of Solids	1030	Non-liquid Waste	Plastic/Glass	None	28 Days	
Lead Emissions	EPA 12	Air	Filter/Solutions	None	6 Months	
Lipids	Pace Lipids	Tissue	Plastic/Glass	$\leq -10^oC$	1 Year if frozen	
Mercury, Low-Level	1631E	Solid	Glass	None	28 Days	
Mercury, Low-Level	1631E	Water	Fluoropolymer bottles (Glass if Hg is only analyte being tested)	12N HCl or BrCl	48 Hours for preservation or analysis; 28 Days to preservation if sample oxidized in bottle; 90 Days for analysis if preserved	Yes
Mercury, Low-Level	1631E	Tissue	Plastic/Glass	$\leq - 10^oC$	28 Days if frozen	
Mercury, Methyl	1630	Water	Teflon/fluoropolymer or Glass	4 mL/L HCl for fresh water, 2 mL/L H2SO4 for saline samples, or fill to the top	6 months if preserved; Distillate – one week if refrigerated; Ethylated distillate –	Yes

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
				with sample so there is no headspace and maintain 0-4 oC until preservation	analyze within 48 hours; Or the samples must be acid preserved within 48 hours of sampling	
Mercury	7471	Solid	8oz Glass Jar	$\leq 6^oC$	28 Days	
Mercury	7470/245.1/ 245.2	Water	Plastic/Glass	pH<2 HNO_3	28 Days	Yes
Mercury	7471/245.6	Tissue	Plastic/Glass	$\leq$ - 10^oC	28 Days if frozen	
Metals (GFAA)	7000/200.9	Water	Plastic/Glass	pH<2 HNO_3	180 Days	
Metals (ICP)	NIOSH 7300A/7303	Air	Filters	None	180 Days	
Metals (ICP/ICPMS)	6010/6020	Solid	8oz Glass Jar	None	180 Days	
Metals (ICP/ICPMS)	6010/6020/ 200.7/200.8	Water	Plastic/Glass	pH<2 HNO_3	180 Days	
Metals (ICP/ICPMS)	6020	Tissue	Plastic/Glass	$\leq -10^oC$	180 Days if frozen	
Methane, Ethane, Ethene	8015 modified	Water	40mL vials	HCl	14 Days	Yes
Methane, Ethane, Ethene	RSK-175	Water	40mL vials	unpreserved	7 Days	Yes
Methane, Ethane, Ethene	EPA 3C	Air	Summa Canister	None	14 Days	
Methane, Ethane, Ethene	EPA 3C	Air	Tedlar Bag or equivalent	None	48 Hours	
Methanol, Ethanol	8015 modified	Water	40mL vials	$\leq 6^oC$	14 Days	Yes
Methanol, Ethanol	8015 modified	Solid	2oz Glass	$\leq 6^oC$	14 Days	
Nitrogen, Ammonia	SM4500NH3/ 350.1	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days	Yes
Nitrogen, Kjeldahl (TKN)	351.2	Solid	Plastic/Glass	$\leq 6^oC$	28 Days	
Nitrogen, Kjeldahl (TKN)	SM4500-Norg/351.2	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days	Yes
Nitrogen, Nitrate	SM4500-NO3/ 352.1	Water	Plastic/Glass	$\leq 6^oC$	24 Hours preferred	Yes
Nitrogen, Nitrate & Nitrite combination	353.2	Solid	Plastic/Glass	$\leq 6^oC$	28 Days	
Nitrogen, Nitrate & Nitrite combination	SM4500-NO3/ 353.2	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days	Yes
Nitrogen, Nitrite or Nitrate separately	SM4500-NO2/ 353.2	Water	Plastic/Glass	$\leq 6^oC$	48 Hours	Yes
Nitrogen, Organic	SM4500-Norg/ 351.2	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days	Yes
Non-Methane Organics	EPA 25C	Air	Summa Canister	None	14 Days	
Non-Methane Organics	EPA 25C	Air	Tedlar Bag or equivalent	None	48 Hours	

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Odor	SM2150B	Water	Glass	$\leq 6^oC$	24 Hours	
Oil and Grease/HEM	1664A/ SM5520B/9070	Water	Glass	pH<2 H_2SO_4 or HCl; $\leq 6^oC$	28 Days	Yes
Oil and Grease/HEM	9071	Solid	Glass	$\leq 6^oC$	28 Days	
PBDEs	1614	Water	1L Amber Glass	$\leq 6^oC$	1 Year/1 Year	Yes
PBDEs	1614	Solid	Wide Mouth Jar	$\leq 6^oC$	1 Year/1 Year	
PBDEs	1614	Tissue	Aluminum Foil	$\leq -10^oC$	1 Year/1 Year	
PCBs and Pesticides, Organochlorine (OC)	TO-4/TO-10	Air	PUF	None	7/40 Days	
PCBs and Pesticides, Organochlorine (OC)	608	Water	1L Amber Glass		Pest: 7/40 Days; PCB: 1 Year/1 Year	
PCBs, Pesticides (OC), Herbicides	508.1	Water	Glass	Na2SO3; pH<2 HCl; < 6^oC	14/30 Days	
Perchlorate	331	Water	Plastic/Glass	>0-6^oC	28 Days	
Pesticides, Organochlorine (OC)	8081	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days	
Pesticides, Organochlorine (OC)	8081	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Pesticides, Organochlorine (OC)	8081	Tissue	8oz Glass Jar	$\leq -10^oC$	1 Year if frozen/40 Days	
Pesticides, Organophosphorous (OP)	8141	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Pesticides, Organophosphorous (OP)	8141	Water	1L Amber Glass	pH 5-8 with NaOH or H_2SO_4; $\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days	Yes
PCBs (Aroclors)	8082	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	1 Year/1 Year	Yes
PCBs (Aroclors)	8082	Solid	8oz Glass Jar	$\leq 6^oC$	1 Year/1 Year	
PCBs (Aroclors)	8082	Tissue	Plastic/Glass	$\leq -10^oC$	1 Year if frozen/1 Year	
PCB Congeners	1668A	Water	1L Amber Glass	$\leq 6^oC$ but above freezing	1 Year/1 Year	Yes
PCB Congeners	1668A	Solid	4-8oz Glass Jar	$\leq 6^oC$ but above freezing	1 Year/1 Year	
PCB Congeners	1668A	Tissue	4-8oz Glass Jar	$\leq -10^oC$	1 Year/1 Year	
Oil Range Organics-ORO		Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Oil Range Organics-ORO		Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days	Yes
Oxygen, Dissolved	SM4500-O	Water	Glass	None	15 minutes	

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
(Probe)						
Paint Filter Liquid Test	9095	Water	Plastic/Glass	None	N/A	Yes
Particulates	PM-10	Air	Filters	None	180 Days	Yes
Permanent Gases	EPA 3C	Air	Summa Canister	None	14 Days	
Permanent Gases	EPA 3C	Air	Tedlar Bag or equivalent	None	48 Hours	
pH	SM4500H+B/ 9040	Water	Plastic/Glass	None	15 minutes	Yes
pH	9045	Solid	Plastic/Glass	None	Contact local lab	Yes
Phenol, Total	420.1/420.4/ 9065/9066	Water	Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days	Yes
Phosphorus, Orthophosphate	SM4500P/ 365.1/365.3	Water	Plastic	Filter; $\leq 6^oC$	Filter within 15 minutes, Analyze within 48 Hours	Yes
Phosphorus, Total	SM4500P/ 365.1/365.3/ 365.4	Water	Plastic/Glass	pH<2 H_2SO_4; $\leq 6^oC$	28 Days	Yes
Phosphorus, Total	365.4	Solid	Plastic/Glass	$\leq 6^oC$	28 Days	Yes
Polynuclear Aromatic Hydrocarbons (PAH)	TO-13	Air	PUF	None	7/40 Days	
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Solid	8oz Glass Jar	$\leq 6^oC$	14/40 Days	
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Water	1L Amber Glass	$\leq 6^oC$; $Na_2S_2O_3$ if Cl present	7/40 Days	Yes
Polynuclear Aromatic Hydrocarbons (PAH)	8270 SIM	Tissue	Plastic/Glass	$\leq -10^oC$	1 Year if frozen/ 40 Days	
Radioactive Strontium	905.0	Water	Plastic/Glass	pH<2 HNO_3	180 days	
Radium-226	903.0/903.1	Water	Plastic/Glass	pH<2 HNO_3	180 days	
Radium-228 (see note 3)	9320/904.0	Water	Plastic/Glass	pH<2 HNO_3	180 days	
Radium-228 (see note 3)	9320	Solid				
Residual Range Organics- Alaska RRO	AK103	Solid	8oz Glass	$\leq 6^oC$	14/40 Days	
Saturated Hydrocarbons	SOP S-MN-O-567	Water	$\leq 6^oC$; pH<2 1:1 HCl (optional)	14/40 Days preserved; 7/40 Days unpreserved	$\leq 6^oC$; pH<2 1:1 HCl (optional)	Yes

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Saturated Hydrocarbons	SOP S-MN-O-567	Solid	$\leq 10^{o}$C	1 Year/40 Days	$\leq 10^{o}$C	
Silica, Dissolved	SM4500Si-D	Water	Plastic	$\leq 6^{o}$C	28 Days	
Solids, Settleable	SM2540F	Water	Glass	$\leq 6^{o}$C	48 Hours	Yes
Solids, Total	SM2540B	Water	Plastic/Glass	$\leq 6^{o}$C	7 Days	Yes
Solids, Total	SM2540G	Solid	Plastic/Glass	$\leq 6^{o}$C	7 Days	
Solids, Total (FOC, OM, Ash)	ASTM D2974	Solid	Plastic/Glass	$\leq 6^{o}$C	7 Days	
Solids, Total Dissolved	SM2540C	Water	Plastic/Glass	$\leq 6^{o}$C	7 Days	Yes
Solids, Total Suspended	SM2540D/USGS I-3765-85	Water	Plastic/Glass	$\leq 6^{o}$C	7 Days	Yes
Solids, Total Volatile	160.4/SM2540E	Water	Plastic/Glass	$\leq 6^{o}$C	7 Days	Yes
Solids, Total Volatile	160.4	Solid	Plastic/Glass	$\leq 6^{o}$C	7 Days	Yes
Specific Conductance	SM2510B/9050/120.1	Water	Plastic/Glass	$\leq 6^{o}$C	28 Days	Yes
Stationary Source Dioxins and Furans	EPA 23	Air	XAD Trap	None	30/45 Days	
Stationary Source Mercury	EPA 101	Air	Filters	None	180 Days, 28 Days for Hg	
Stationary Source Metals	EPA 29	Air	Filters	None	180 Days, 28 Days for Hg	
Stationary Source PM10	EPA 201A	Air	Filters	None	180 Days	
Stationary Source Particulates	EPA 5	Air	Filter/Solutions	None	180 Days	
Sulfate	SM4500SO4/9036/9038/375.2/ASTM D516	Water	Plastic/Glass	$\leq 6^{o}$C	28 Days	Yes
Sulfide, Reactive	SW-846 Chap.7	Water	Plastic/Glass	None	28 Days	
Sulfide, Reactive	SW-846 Chap.7	Solid	Plastic/Glass	None	28 Days	
Sulfide, Total	SM4500S/9030	Water	Plastic/Glass	pH>9 NaOH; ZnOAc; $\leq 6^{o}$C	7 Days	
Sulfite	SM4500SO3	Water	Plastic/Glass	None	15 minutes	
Surfactants (MBAS)	SM5540C	Water	Plastic/Glass	$\leq 6^{o}$C	48 Hours	Yes
Total Organic Carbon (TOC)	SM5310B,C,D/9060	Water	Glass	pH<2 H_2SO_4 or HCl; $\leq 6^{o}$C	28 Days	
Total Organic Carbon (TOC)	9060/Walkley Black	Solid	Glass	$\leq 6^{o}$C	14 Days	
Total Organic Halogen (TOX)	SM5320/9020/9021	Water	Glass; no headspace	$\leq 6^{o}$C	14 Days	Yes
Tritium	906.0	Water	Glass	None	180 days	
Turbidity	SM2130B/180.1	Water	Plastic/Glass	$\leq 6^{o}$C	48 Hours	Yes
Total Uranium	908.0/ASTM D5174-97	Water	Plastic/Glass	pH<2 HCl	180 days	
Volatile Petroleum	MA-VPH	Water	40mL vials	pH<2 HCl;	14 Days preserved	Yes

Parameter	Method	Matrix	Container	Preservative	Max Hold Time	Additional Volume for MS/MSD
Hydrocarbons (aliphatic and aromatic)				$\leq$ 6°C		
Volatile Petroleum Hydrocarbons (aliphatic and aromatic)	MA-VPH	Solid	4-8oz Glass Jar	$\leq$ 6°C; packed jars with no headspace	7/28 Days	
Volatiles	TO-14	Air	Summa Canister	None	30 Days	
Volatiles	TO-14	Air	Tedlar Bag or equivalent	None	48 Hours	
Volatiles	TO-15	Air	Summa Canister	None	30 Days	
Volatiles	TO-18/8260	Air	Tedlar Bag or equivalent	None	72 Hours	
Volatiles	8260	Solid	5035 vial kit	See note 1	14 days	Yes
Volatiles	8260	Water	40mL vials	pH<2 HCl; $\leq$ 6°C; $Na_2S_2O_3$ if Cl present	14 Days	Yes
Volatiles	8260	Conc. Waste	5035 vial kit or 40mL vials	$\leq$ 6°C	14 Days	
Volatiles	624	Water	40mL vials	pH<2 HCl; $\leq$ 6°C; $Na_2S_2O_3$ if Cl present	14 Days (7 Days for aromatics if unpreserved)	Yes
Volatiles (see note 2)	524.2	Water	40mL vials (in duplicate)	pH<2 HCl; $\leq$ 6°C; Ascorbic acid or $Na_2S_2O_3$ if Cl present[2]	14 Days	Yes
UCMR3 Metals	200.8	Water	Plastic or glass	pH<2 HNO_3	28 Days	
UCMR3 Hexavalent Chromium	218.7	Water	HDPE or propylene	$Na_2CO_3/NaHCO_3/(NH_4)_2SO_4$; pH>8	14 Days	
UCMR3 Chlorate	300.1	Water	Plastic or glass	EDA	28 Days	
UCMR3 Hormones	539	Water	Amber glass	$Na_2S_2O_3$, 2-mercaptopyridine-1-oxide, sodium salt	28 Days	
UCMR3 Perfluorinated Compounds	537	Water	Polypropylene	Trizma	14 Days	
UCMR3 Volatiles	524.3	Water	40 mL amber glass vials	Ascorbic acid. Maleic acid pH~2	14 Days	
UCMR3 1, 4 Dioxane	522	Water	Glass	Na_2SO_3, $NaHSO_4$; pH<4	28 Days	
UV254	SM5910B	Water	Glass	$\leq$ 6°C	48 Hours	

[1] **5035/5035A Note**: 5035 vial kit typically contains 2 vials water, preserved by freezing **or**, 2 vials aqueous sodium bisulfate preserved at 4°C, **and** one vial methanol preserved at $\leq$6°C **and** one container of unpreserved sample stored at $\leq$6°C.

[2] Method 524.2 lists ascorbic acid as the preservative when residual chlorine is suspected, unless gases or Table 7 compounds are NOT compounds of interest and then sodium thiosulfate is the preservative recommended.

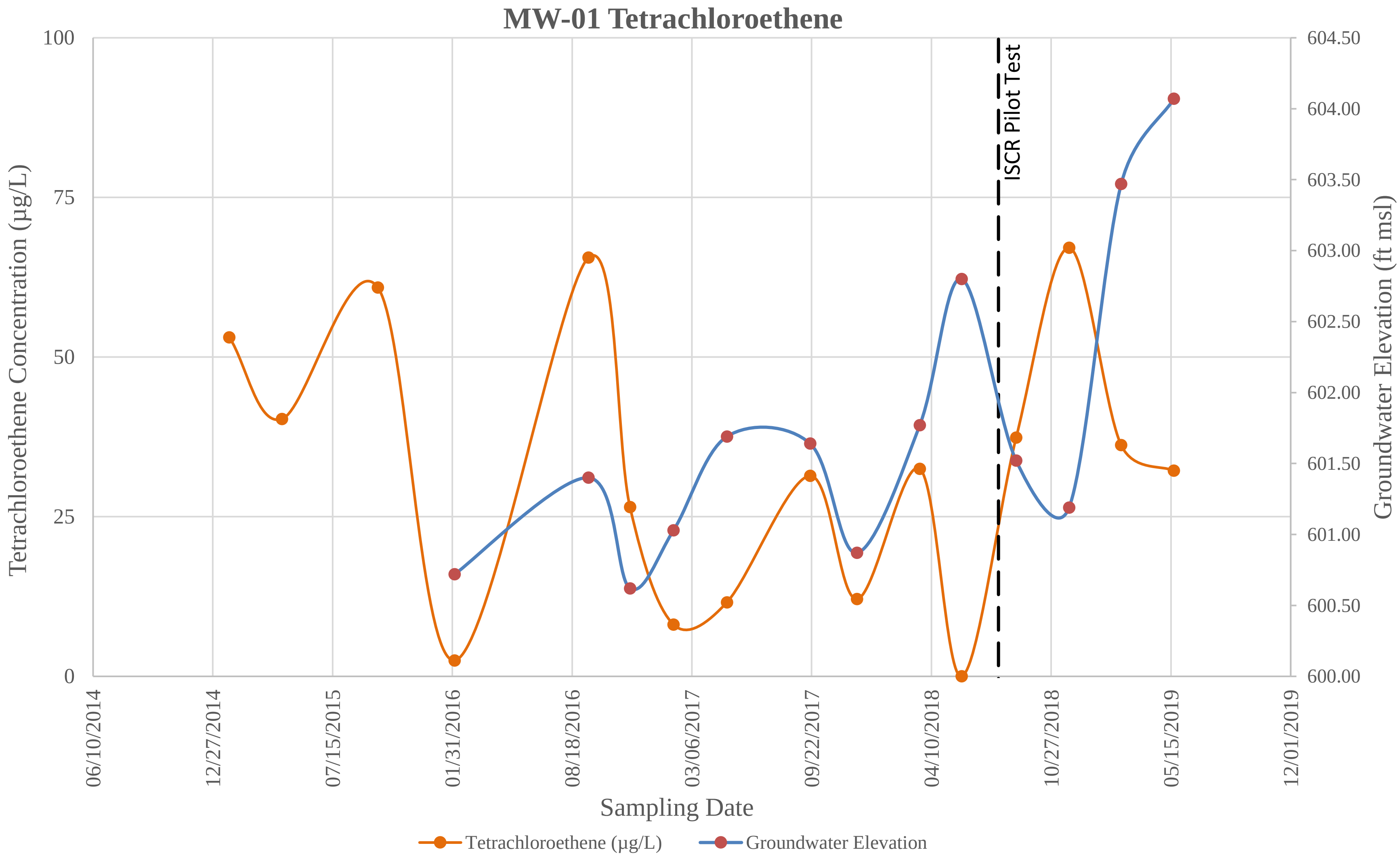
[3] Methods 9315 and 9320 both state that if samples are unpreserved, the samples should be brought to the lab within 5 days of collection, preserved in the lab, and then allowed to sit for a minimum of 16 hours before sample preparation/analysis.

[4] The holding time for hexavalent chromium may be extended by the addition of the ammonium buffer listed in EPA 218.6 per the 2012 EPA Method Update Rule.Although Method 218.6 stipulates a different pH range (9.0 to 9.5) for buffering, this method requirement was modified in the Method Update Rule to a pH range of 9.3 to 9.7.For non-potable waters, adjust the pH of the sample to 9.3 to 9.7 during collection with the method required ammonium sulfate bufferto extend the holding time to 28 days. For potable waters, addition of the buffer during collection will extend the holding time for 14 days per EPA 218.7 and the EPA UCMR3 program.

APPENDIX L

Dissolved PCE Concentration Trends

Attachment C. Dissolved PCE Concentration Trends
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402



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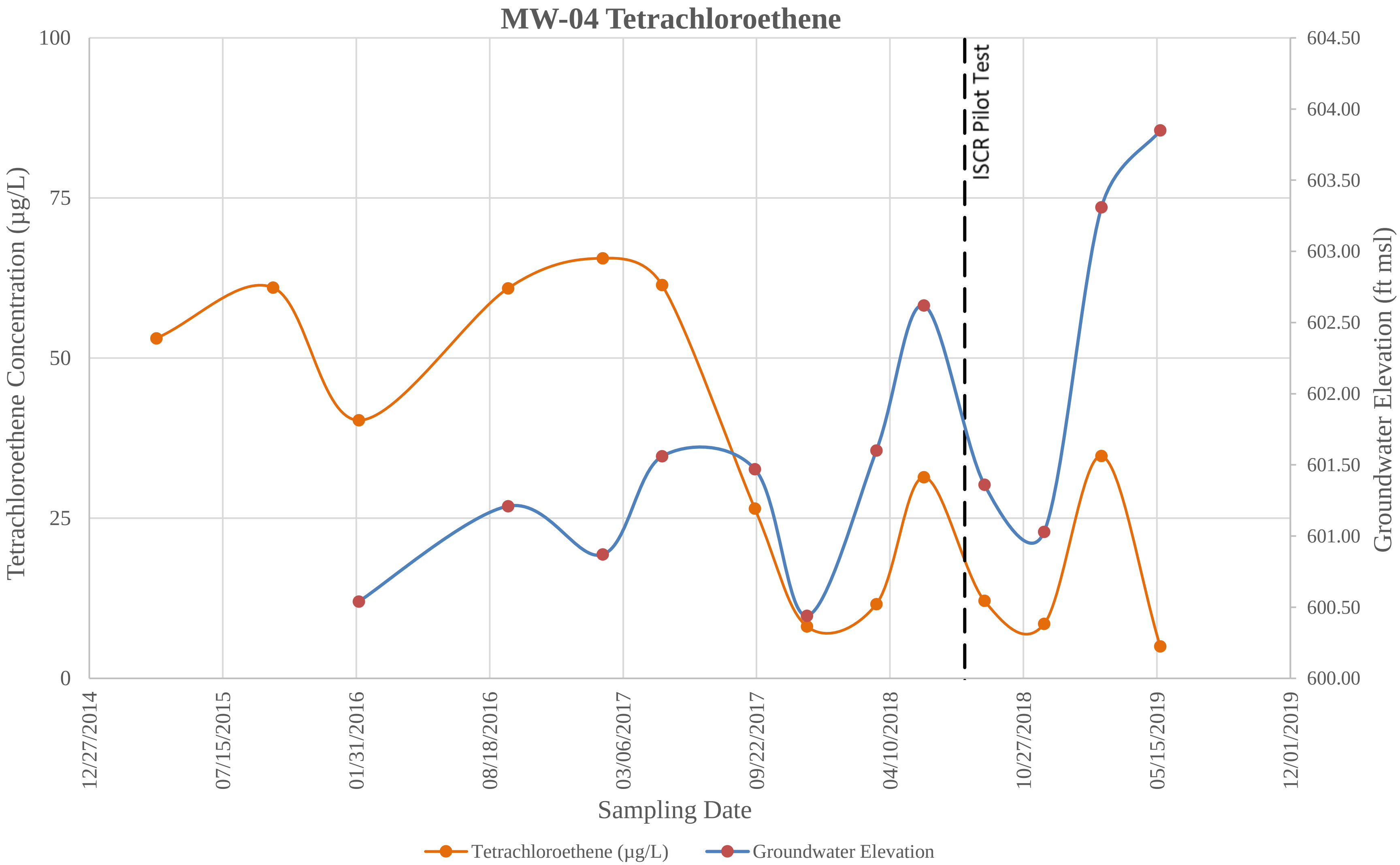
State Cleanup #0000402



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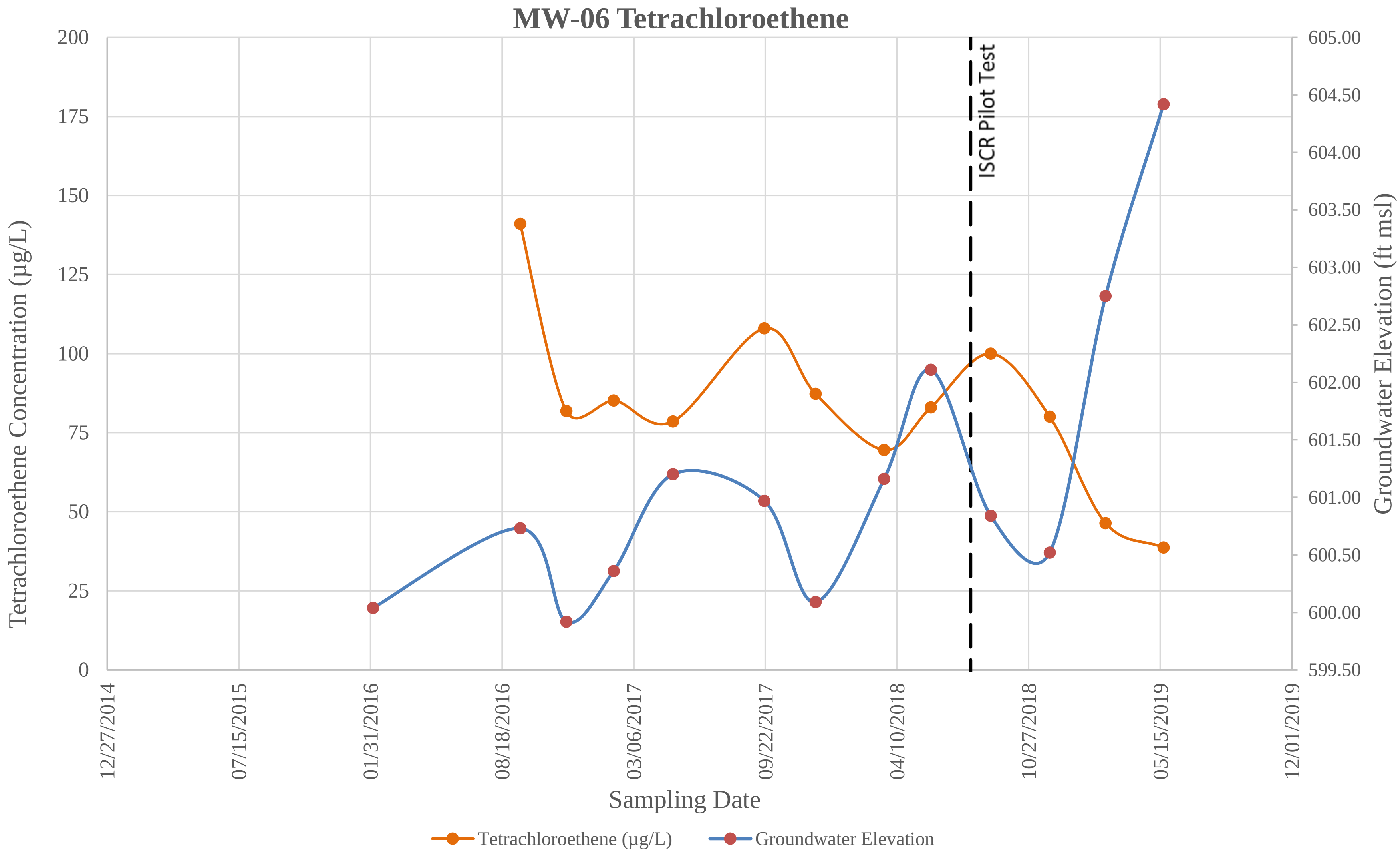
State Cleanup #0000402



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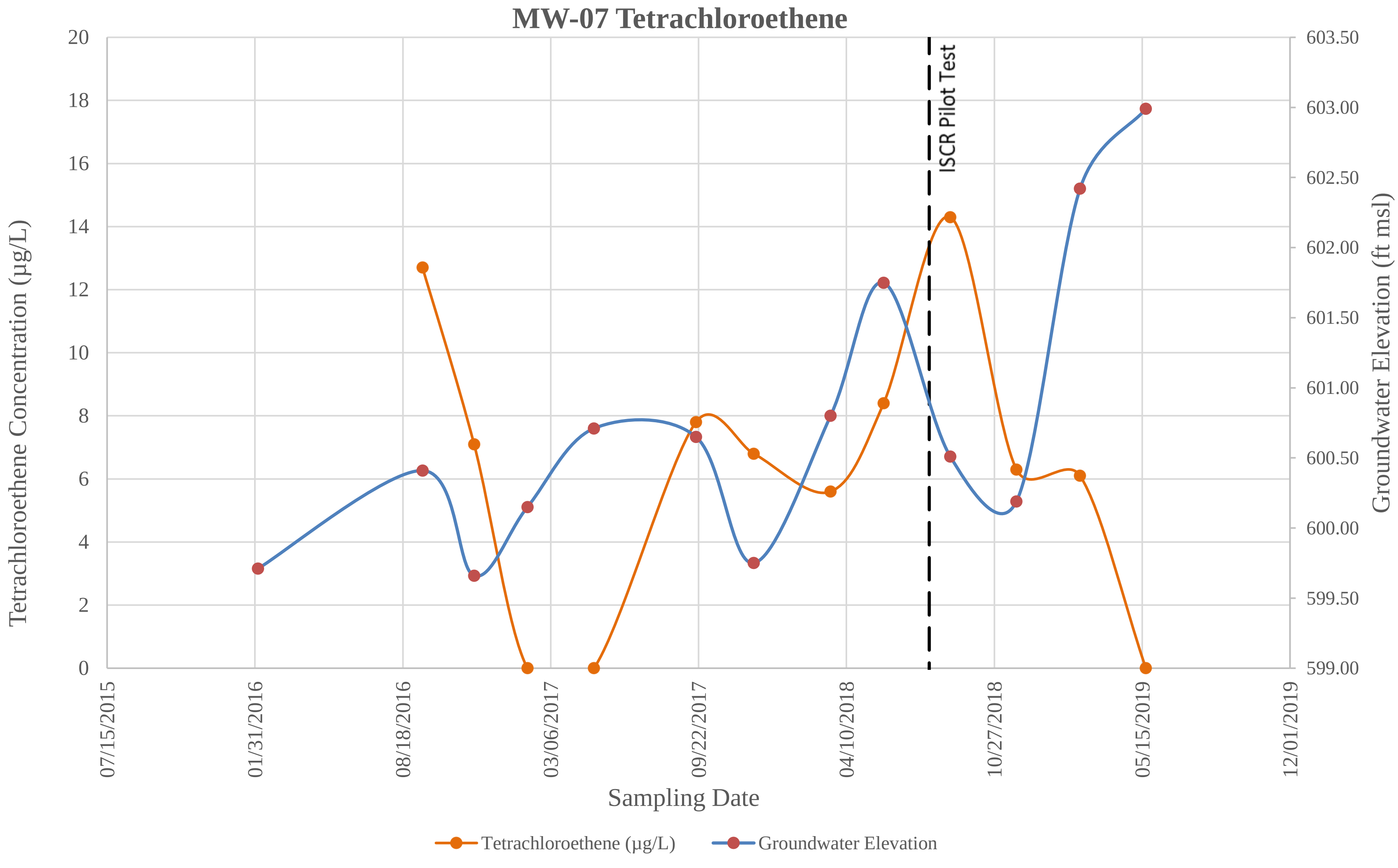
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402



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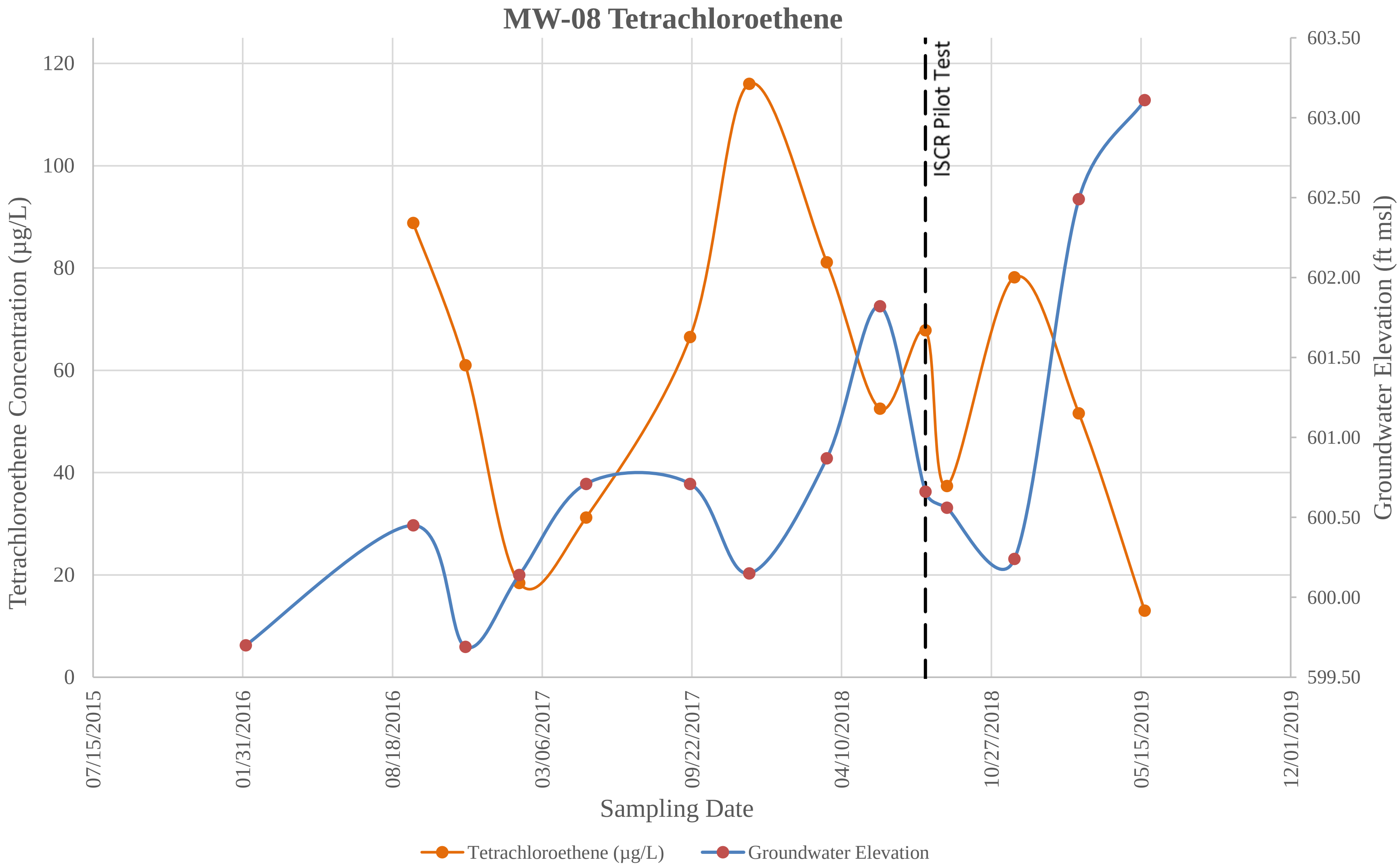

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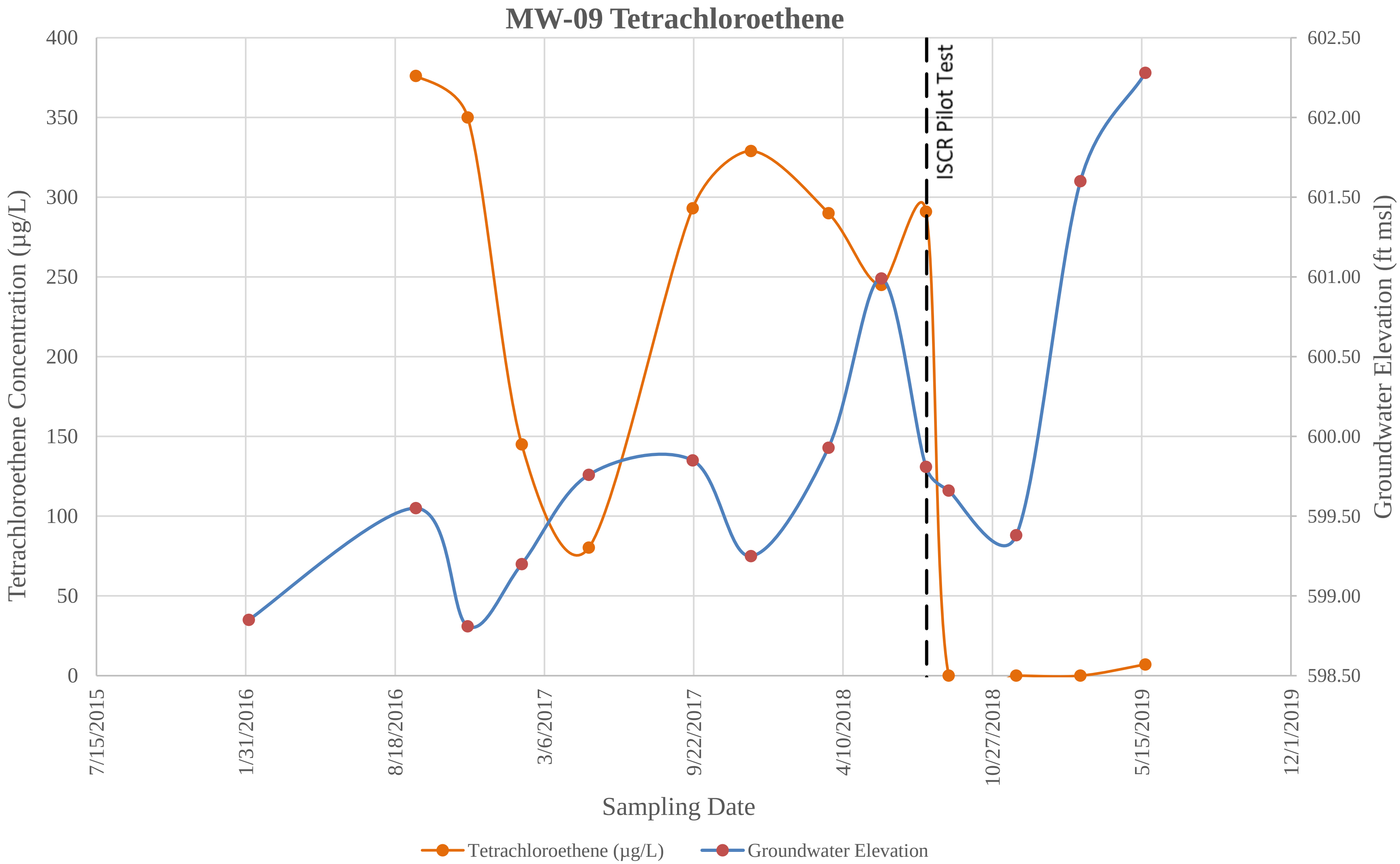

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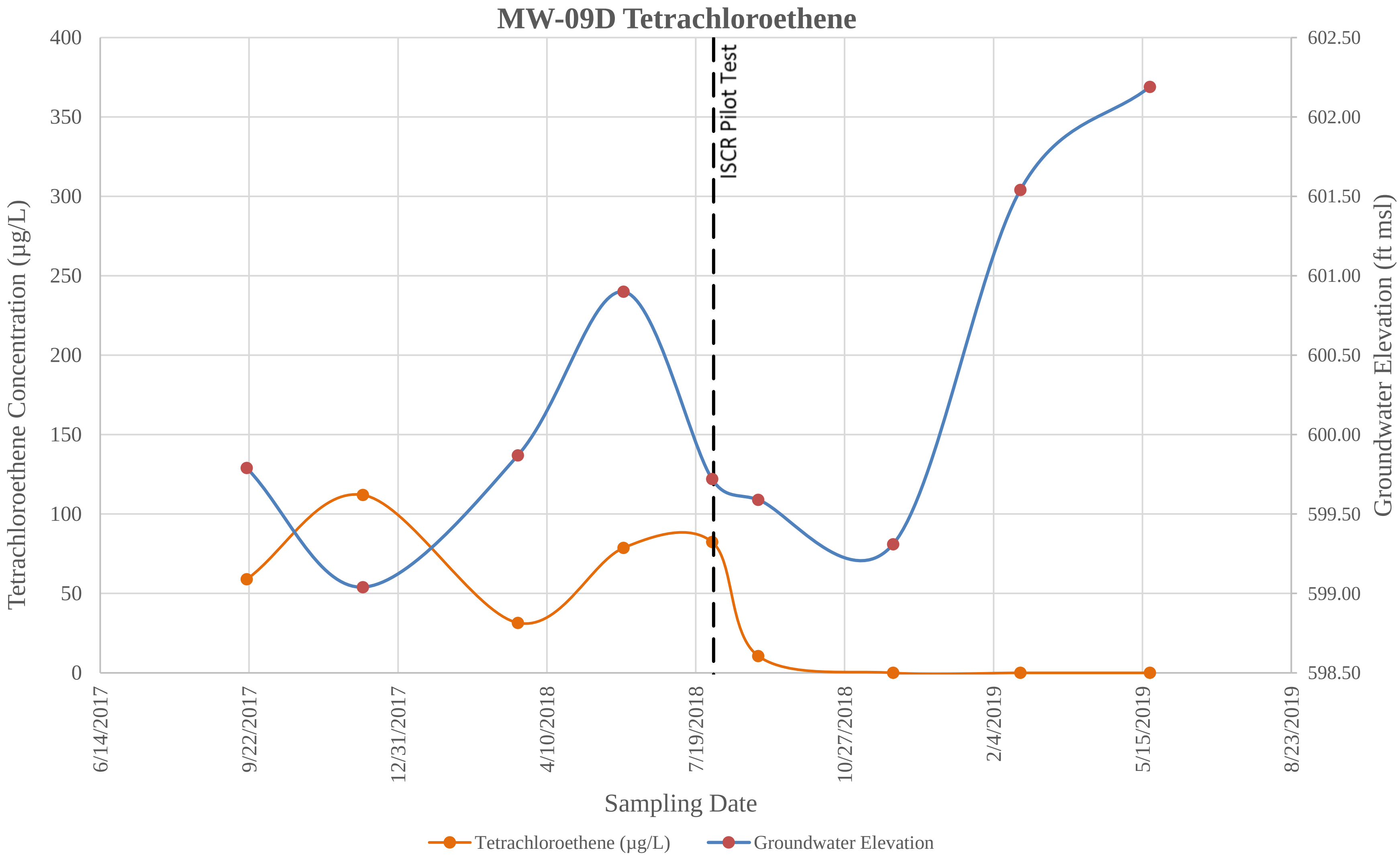

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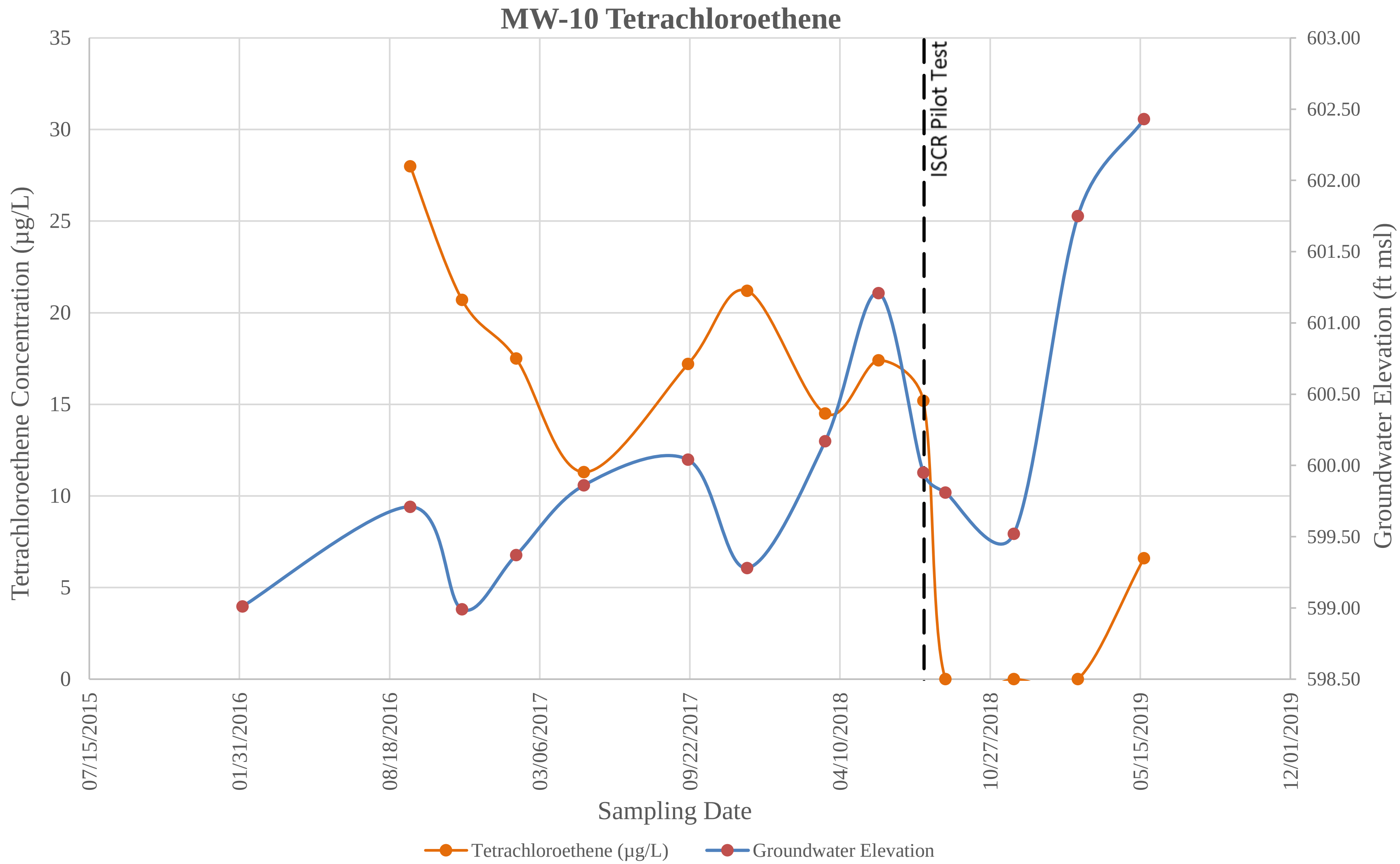

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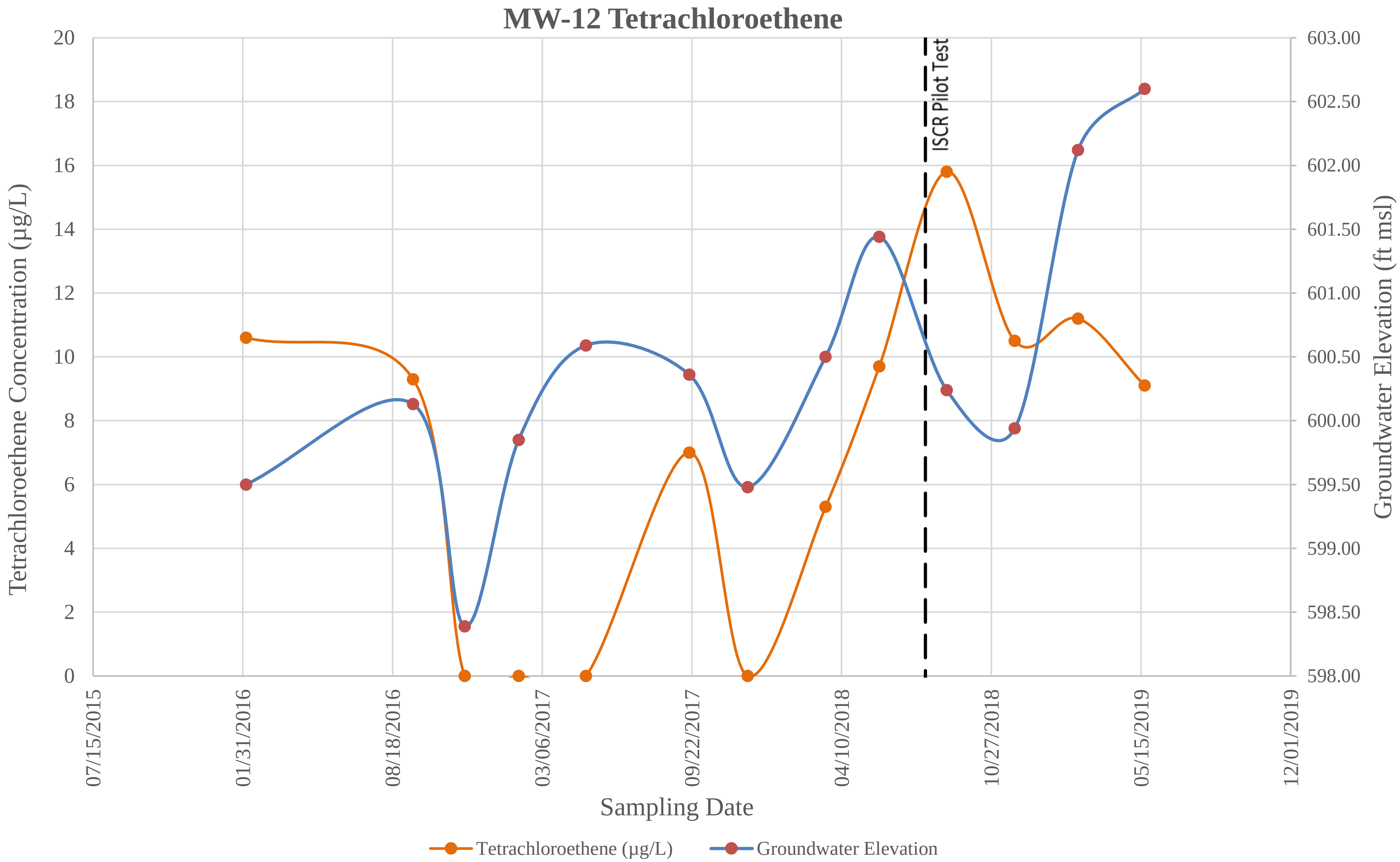

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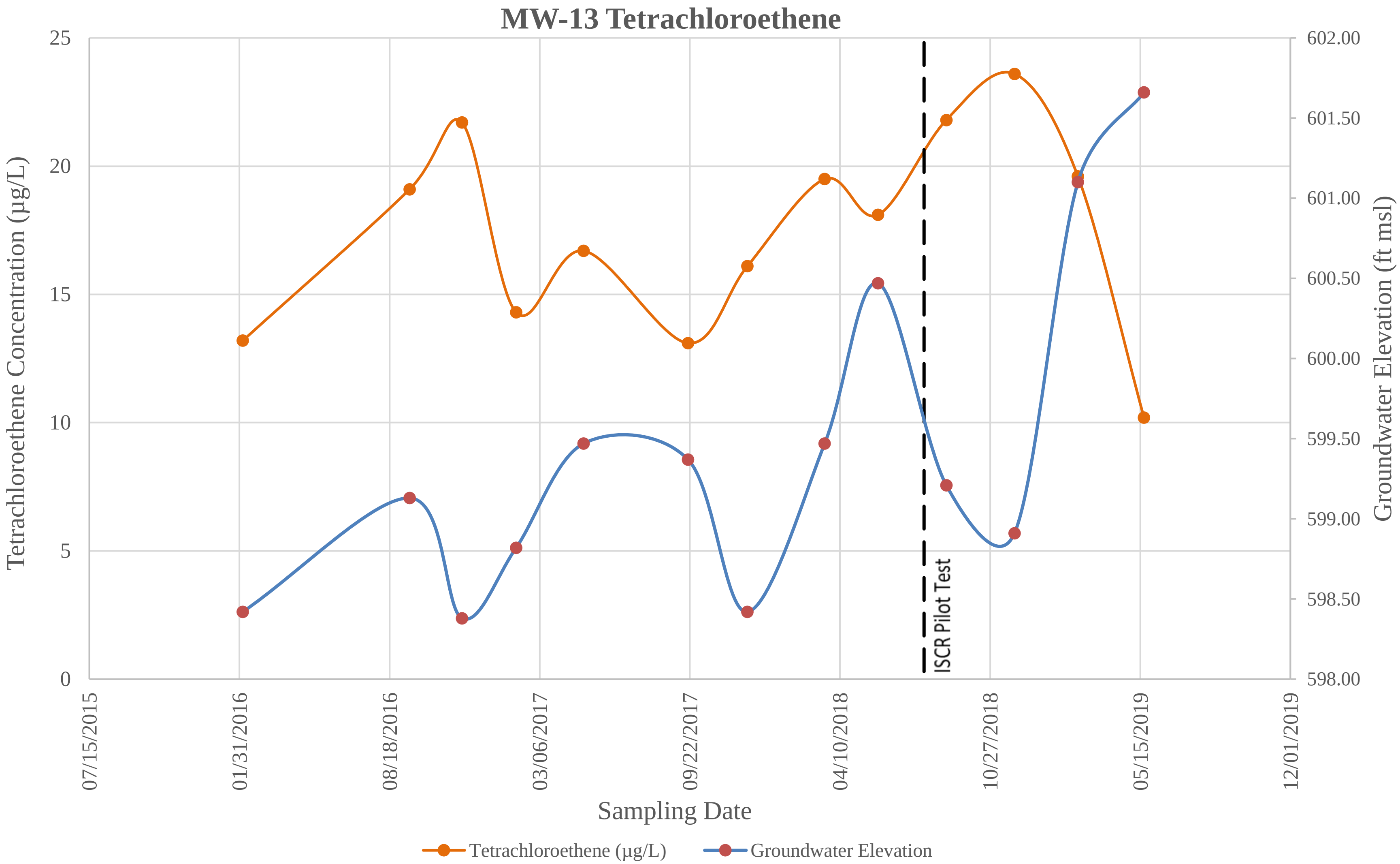

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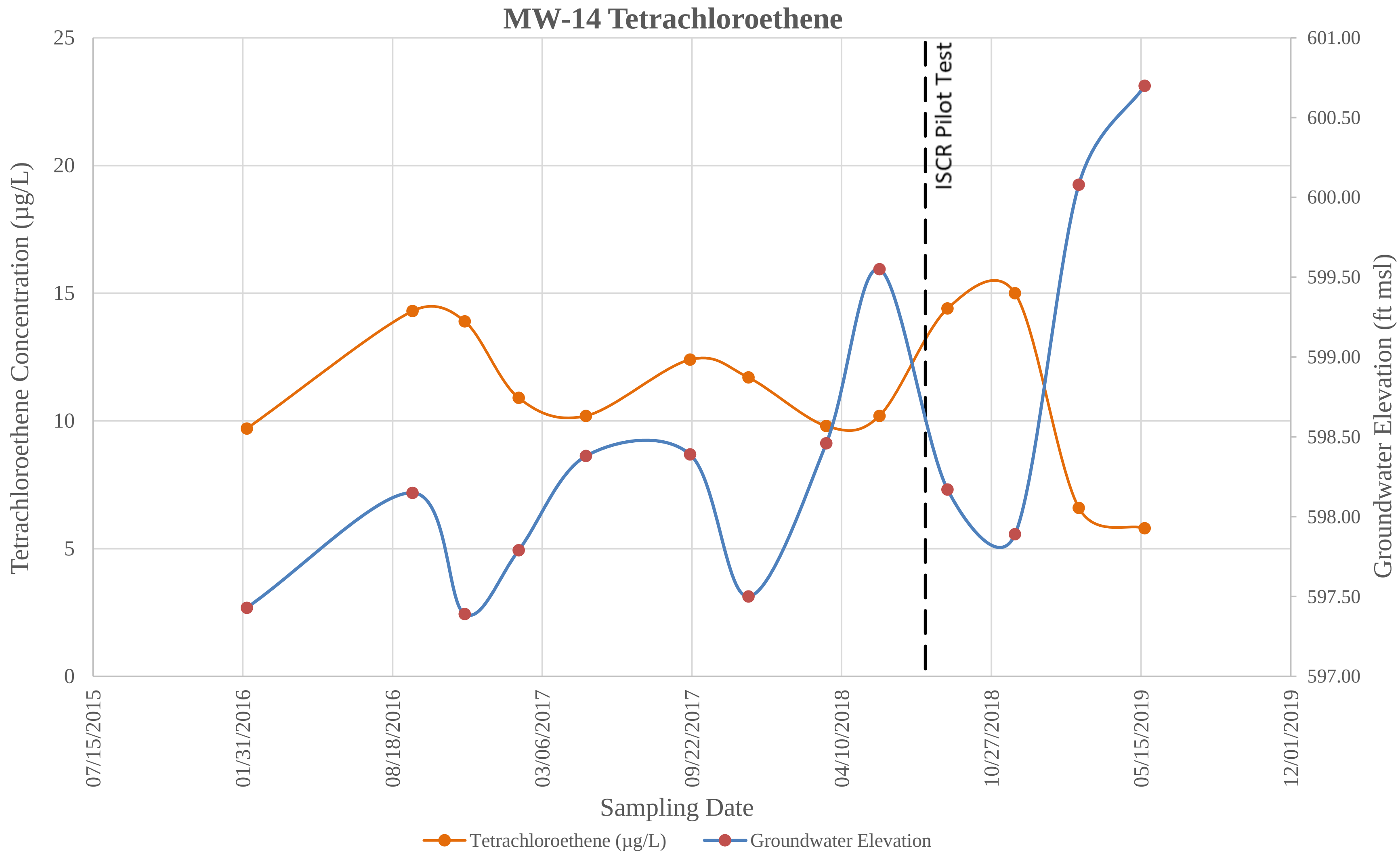

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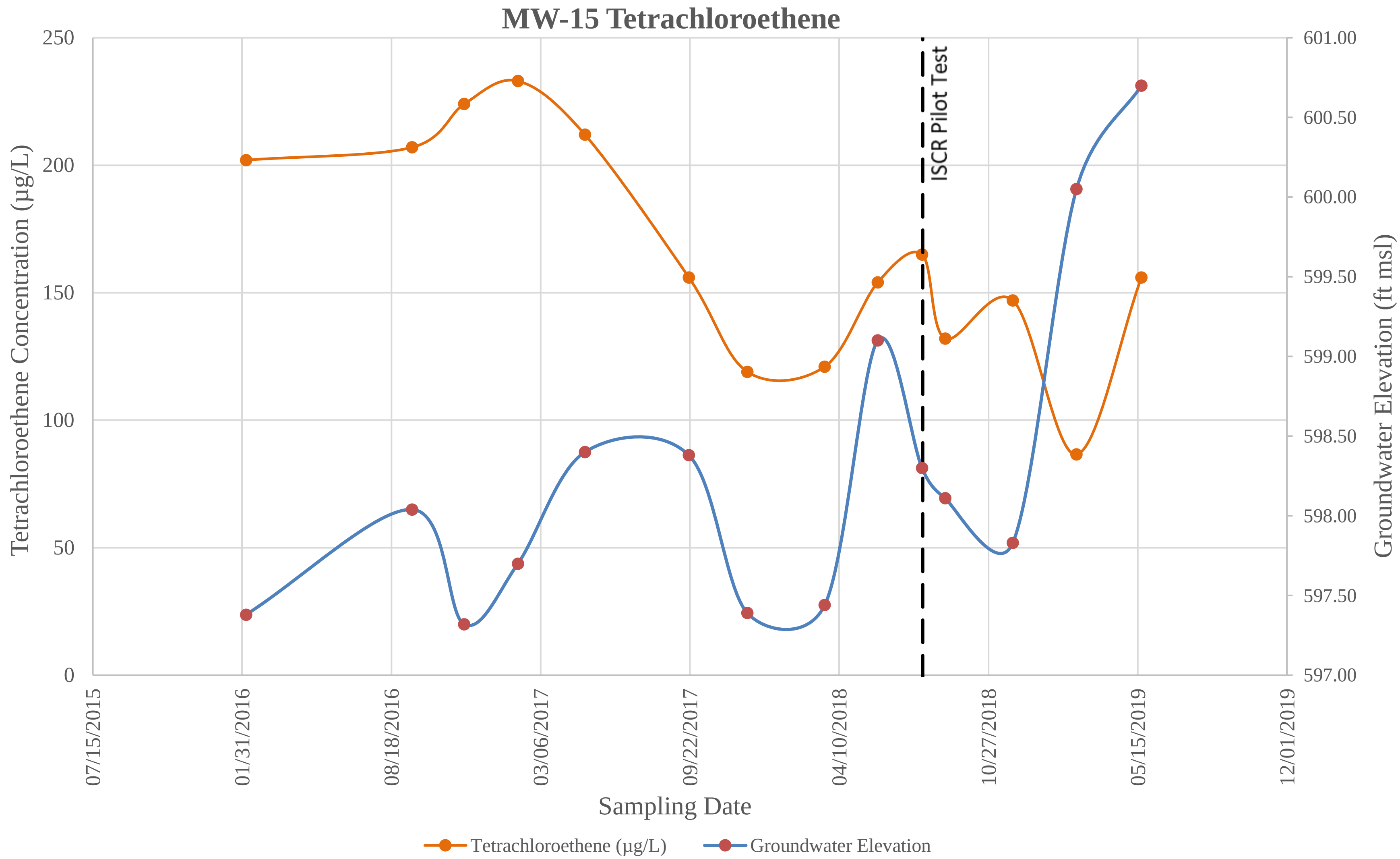

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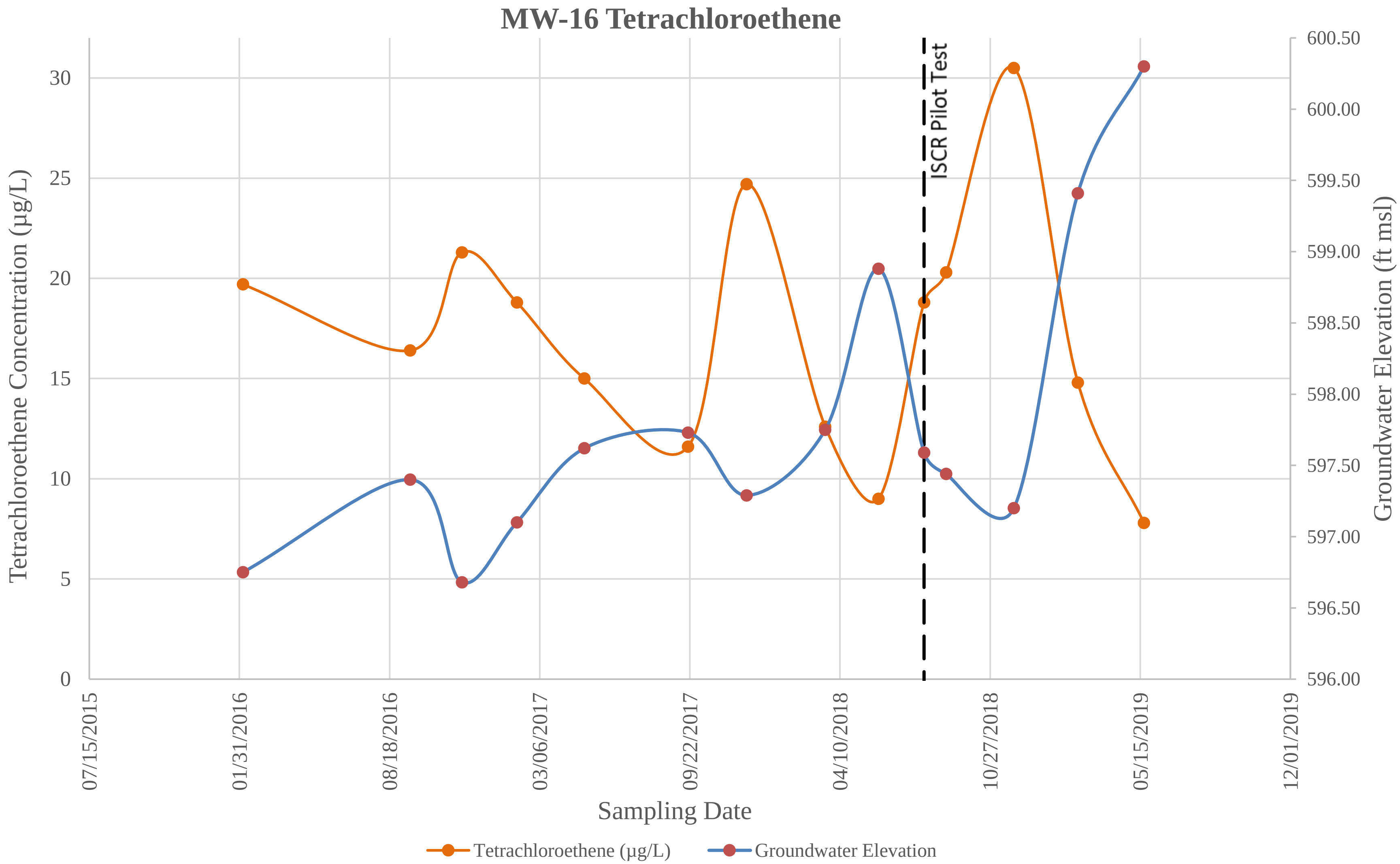

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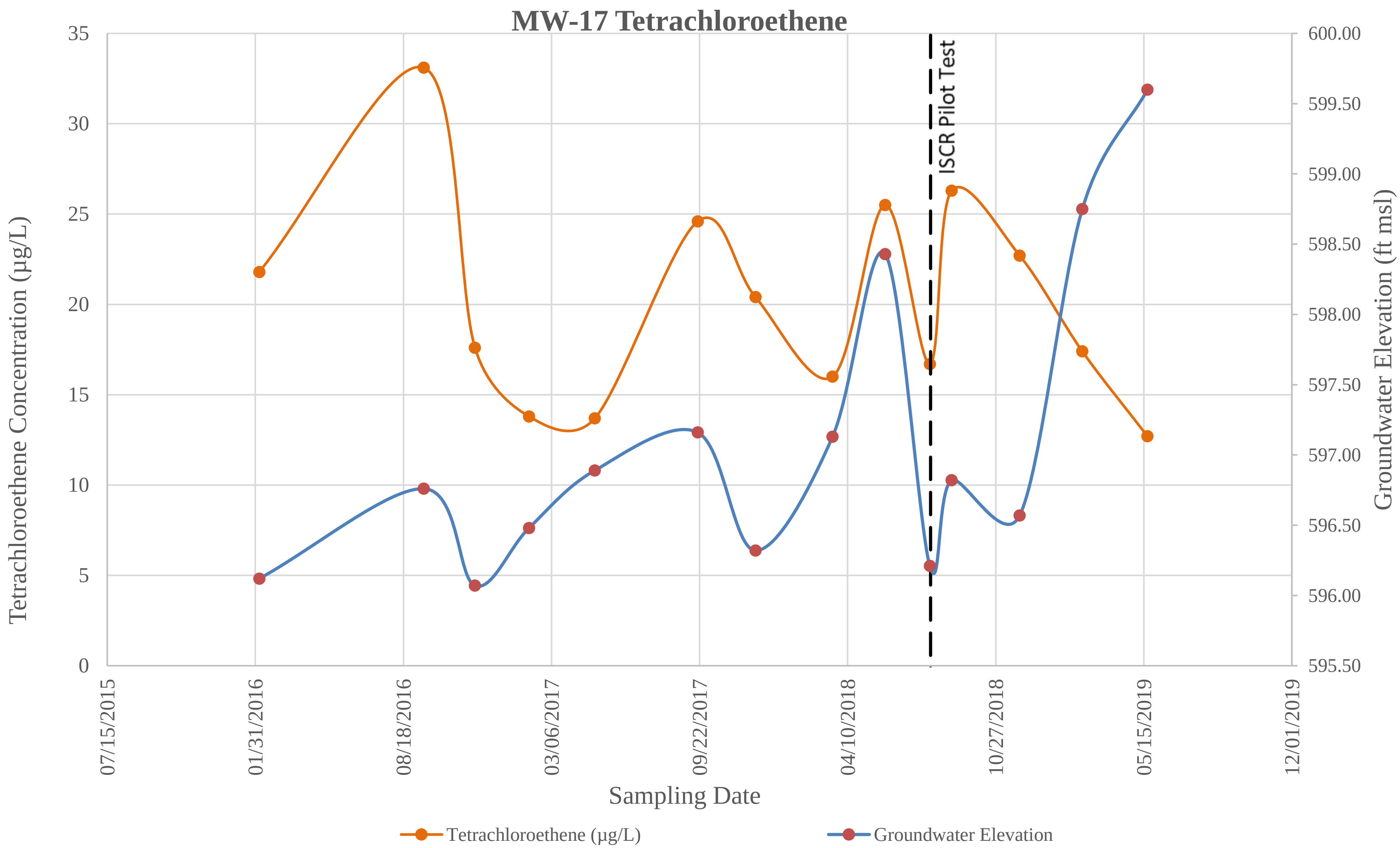

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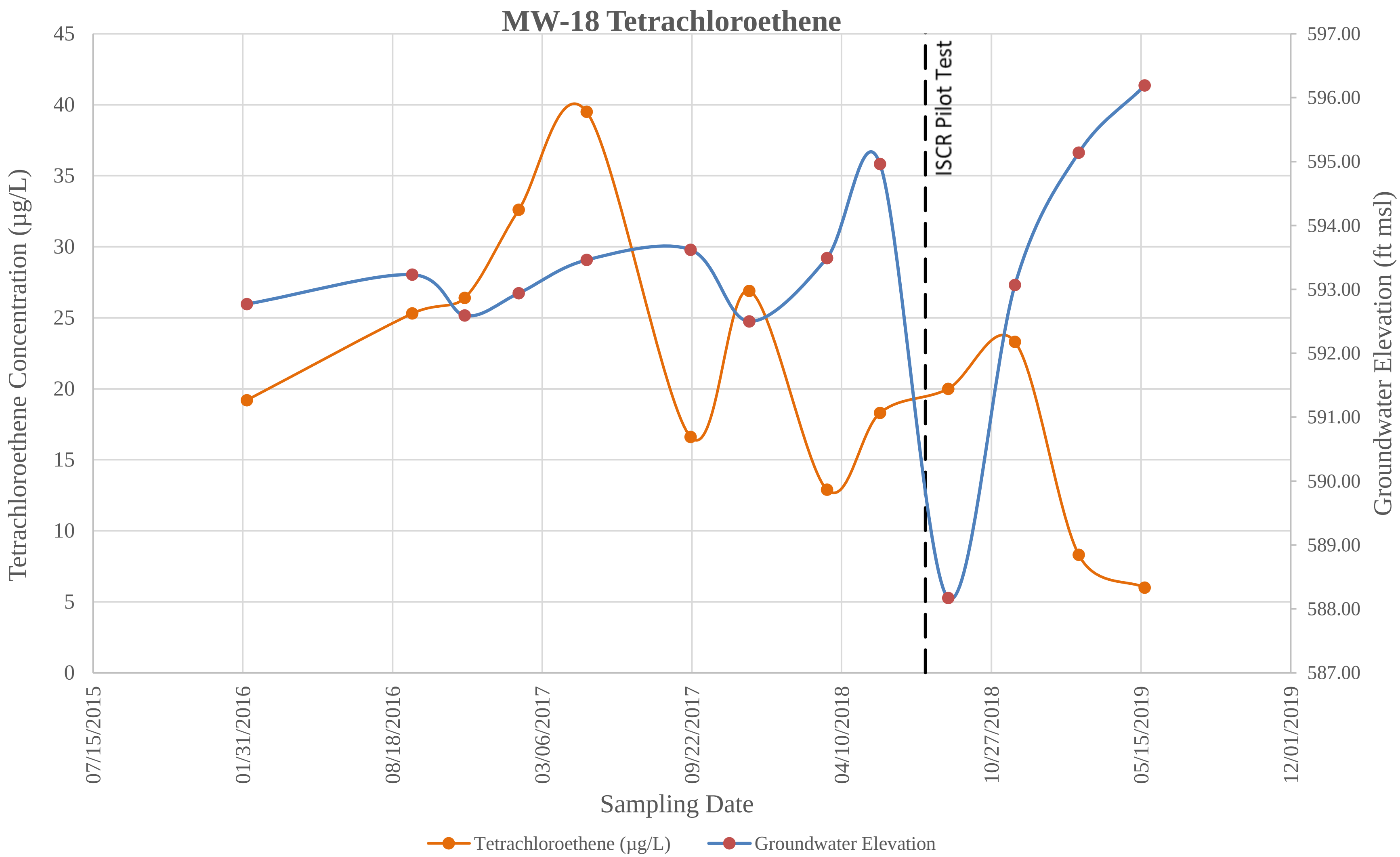

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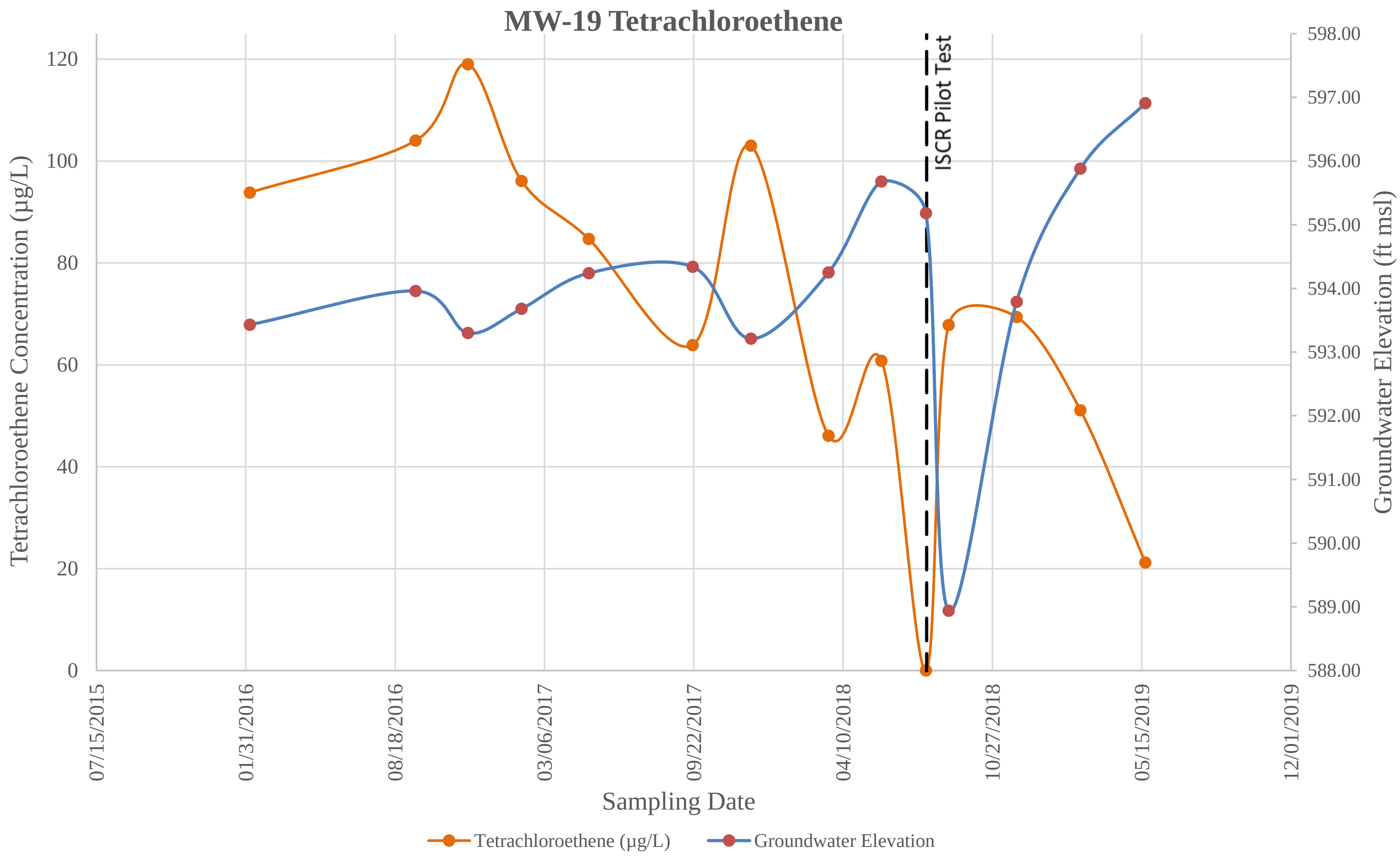

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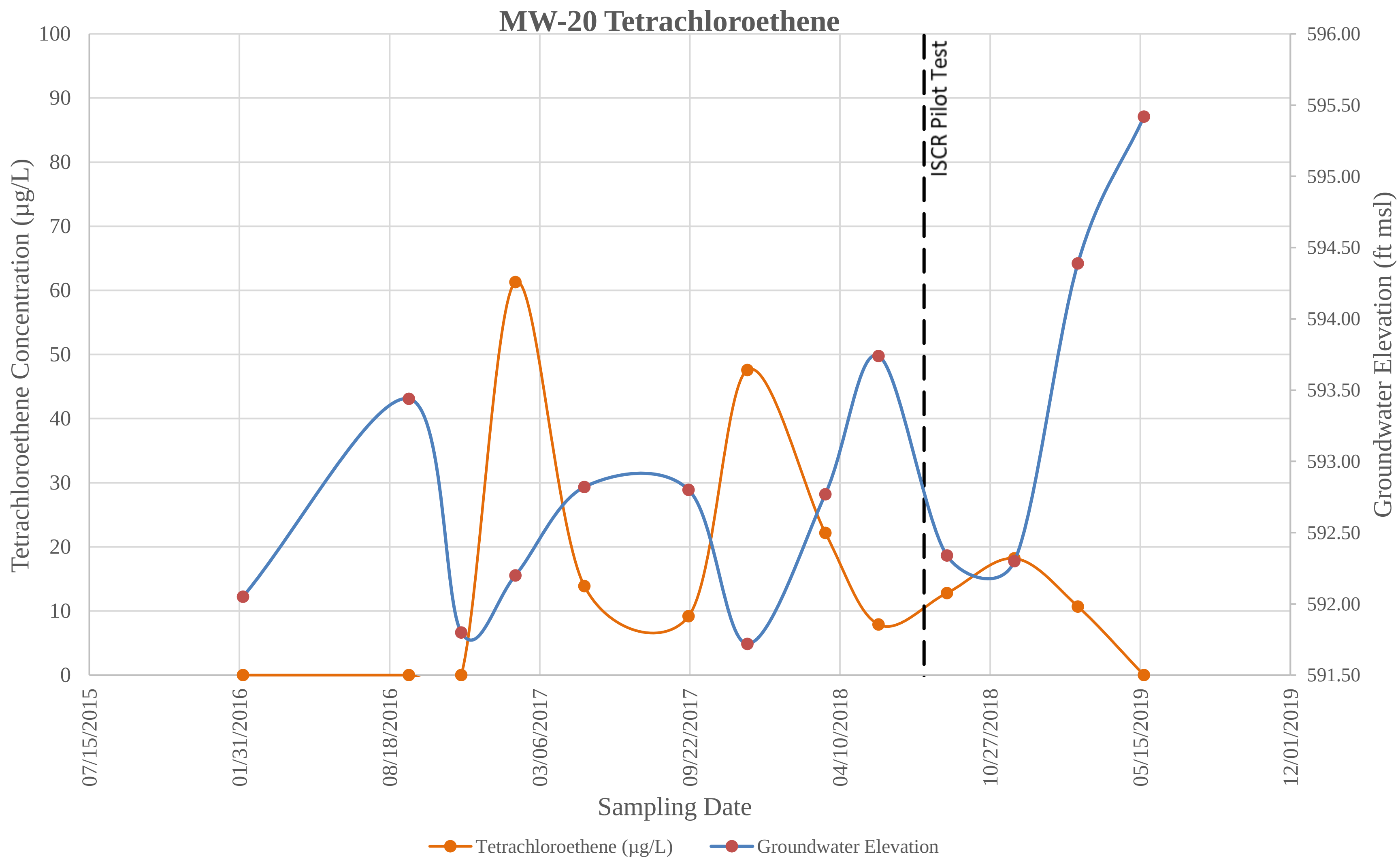

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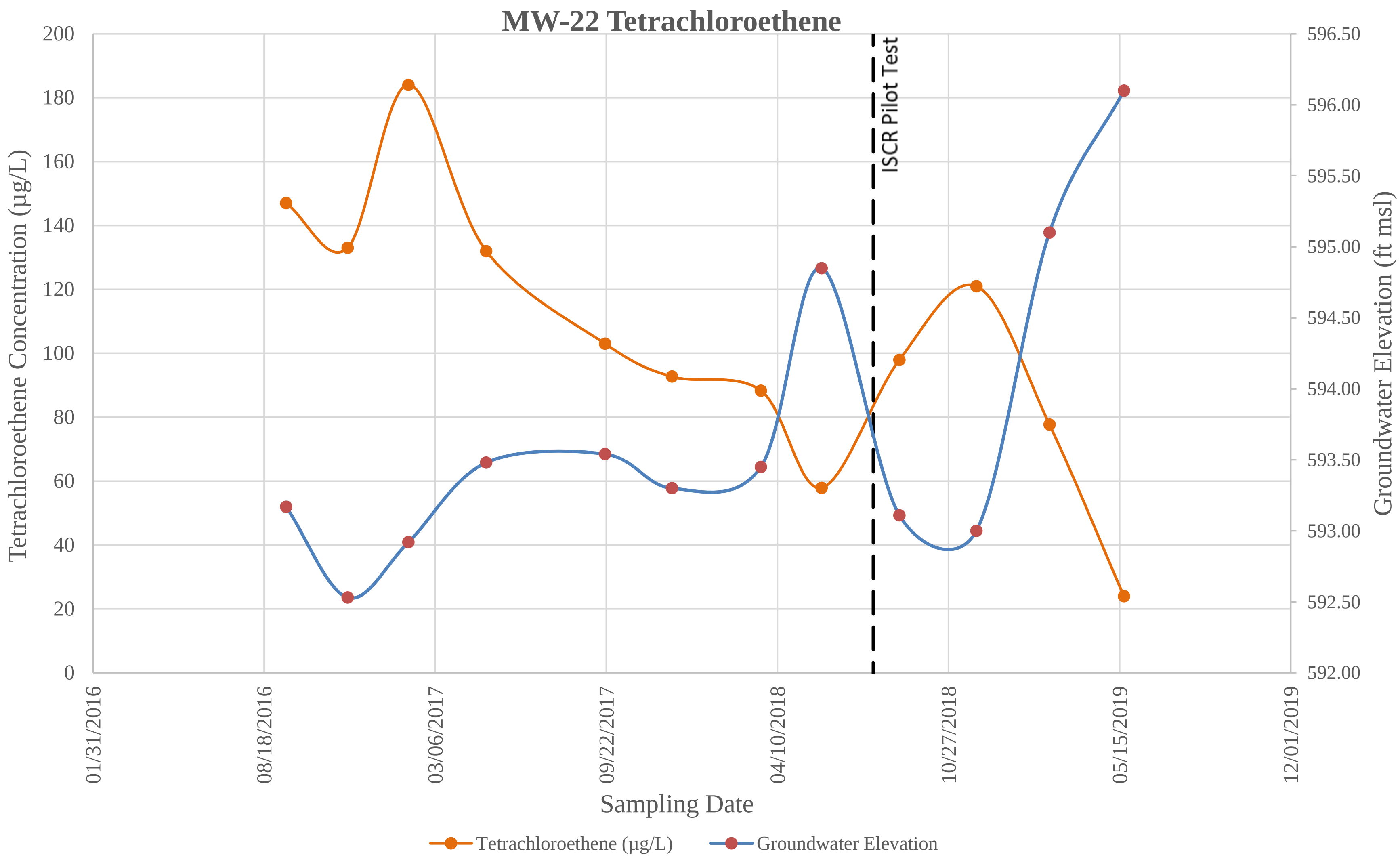

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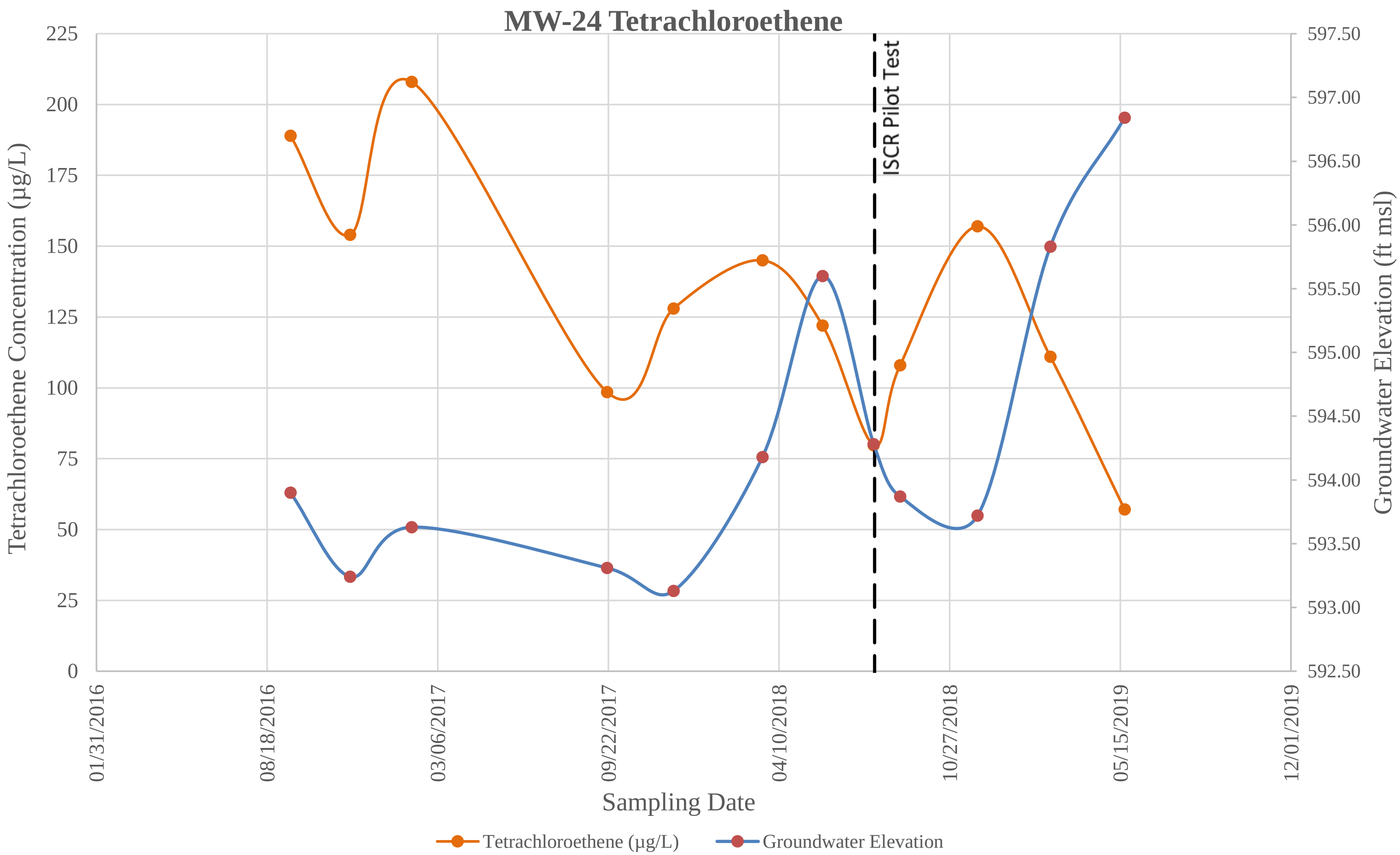

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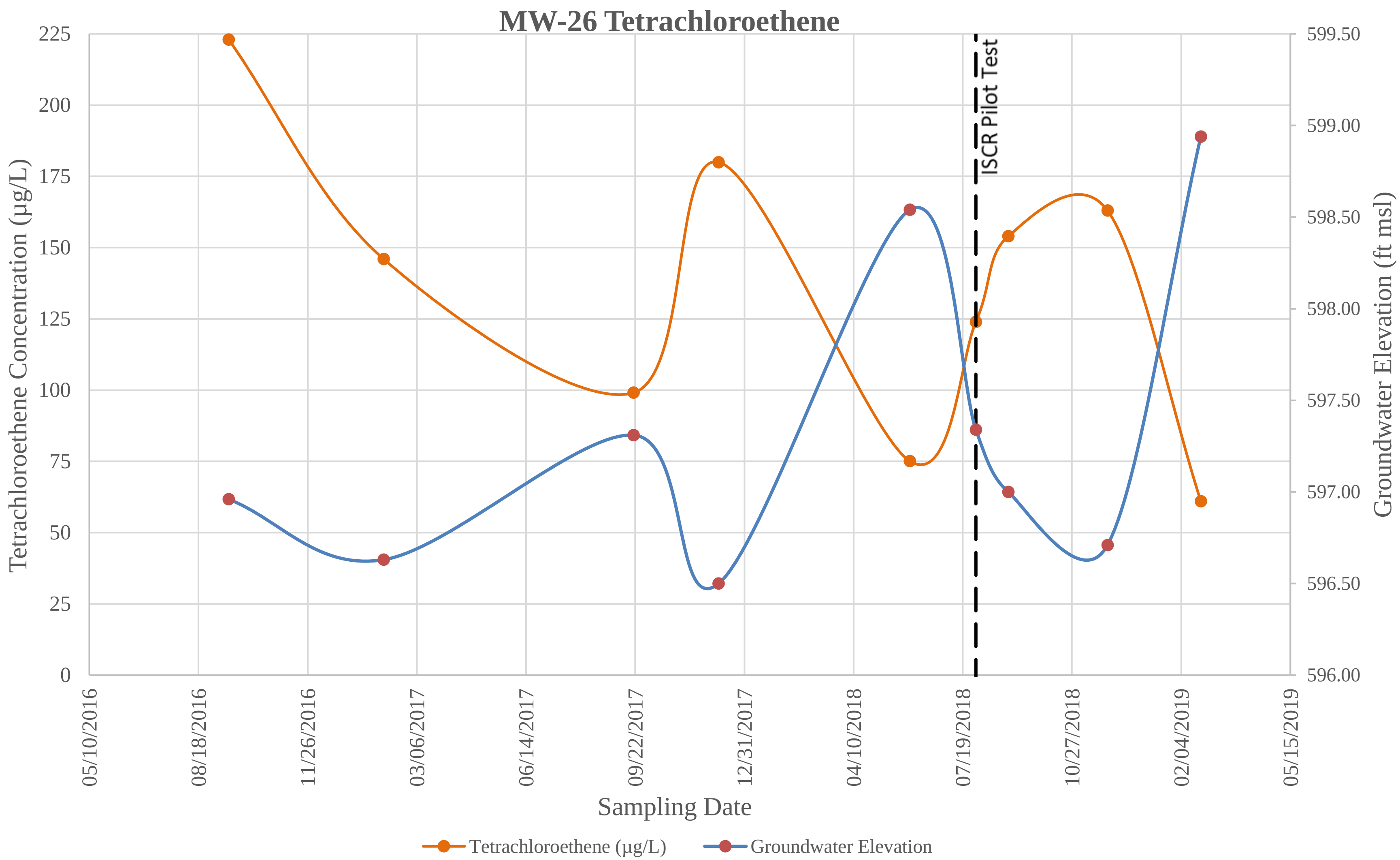

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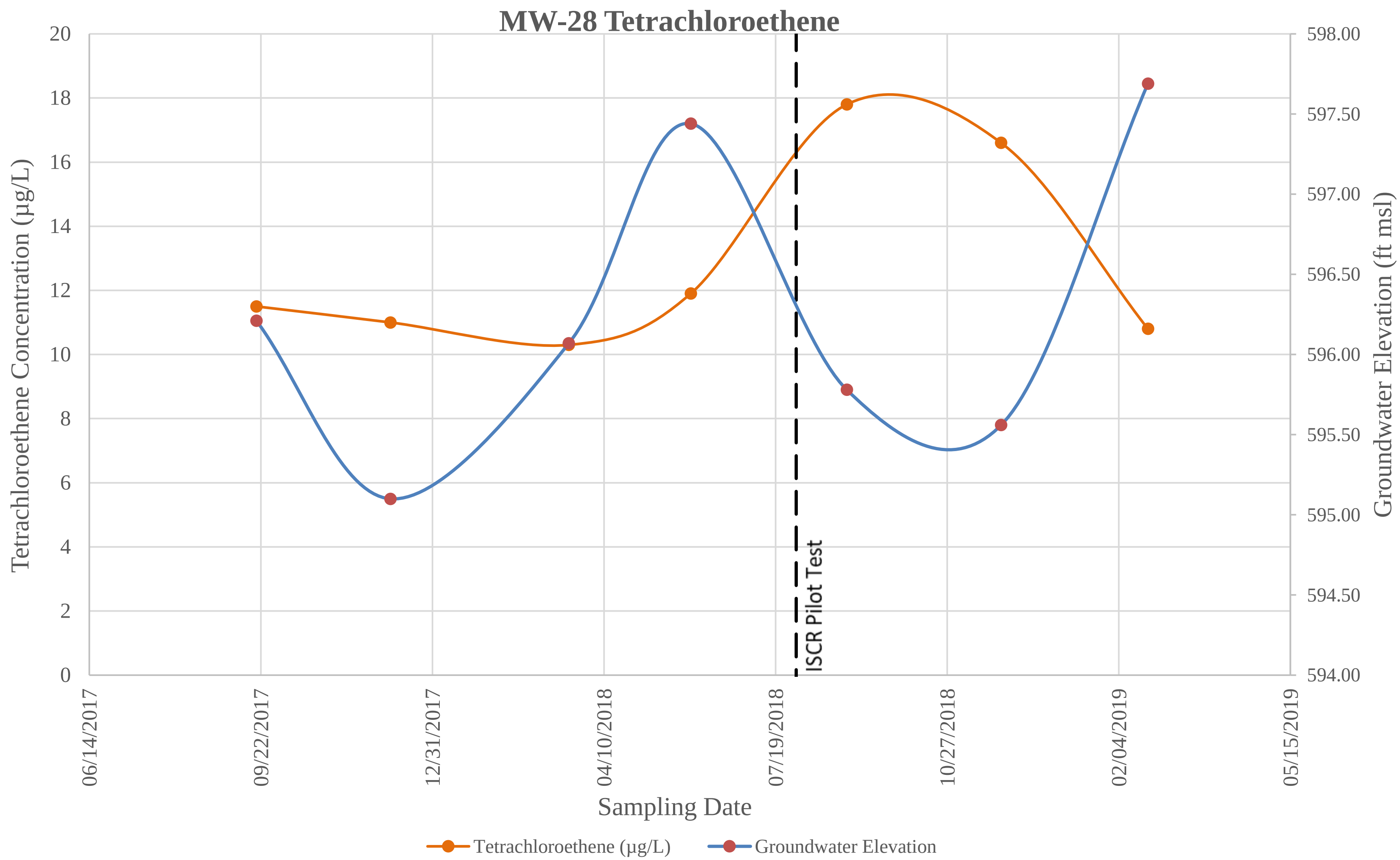
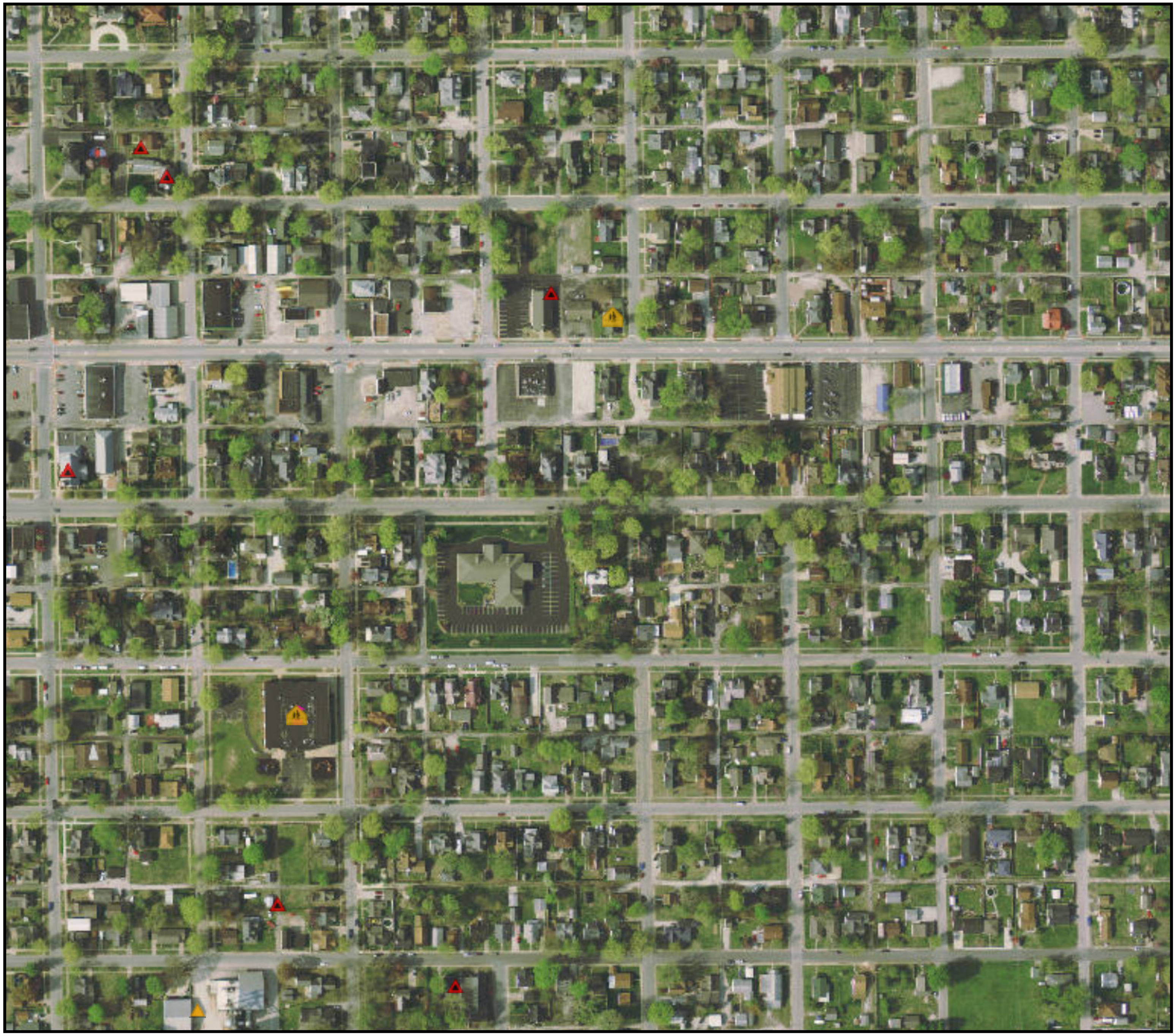


APPENDIX M

Sensitive Receptors Map

Sensitive Receptors

Date: 10/5/2018



Legend

- Schools (MHMP)
- Police Stations (MHMP)
- Medical Care Facilities (MHMP)
- Fire Stations (MHMP)

Care Facilities - Long Term (ISDH)

- Hospice
- Nursing Home
- Residential Care Facility

Hospitals and Rural Health Clinics (I

- Church Hospital
- Hospital District
- Local Hospital
- Other Hospital
- Private Hospital
- Proprietary Hospital
- Rural Health Clinic
- State Hospital
- Hospitals (IDHS)
- Fire Stations (IDHS)
- Emergency Med. Services (IDHS)
- Hospitals (HAZUS)
- Schools (IDOE)

Trails (IDNR)

- Open
- Planned
- Under Development

Author:

0 — 0.1 mi

IndianaMAP

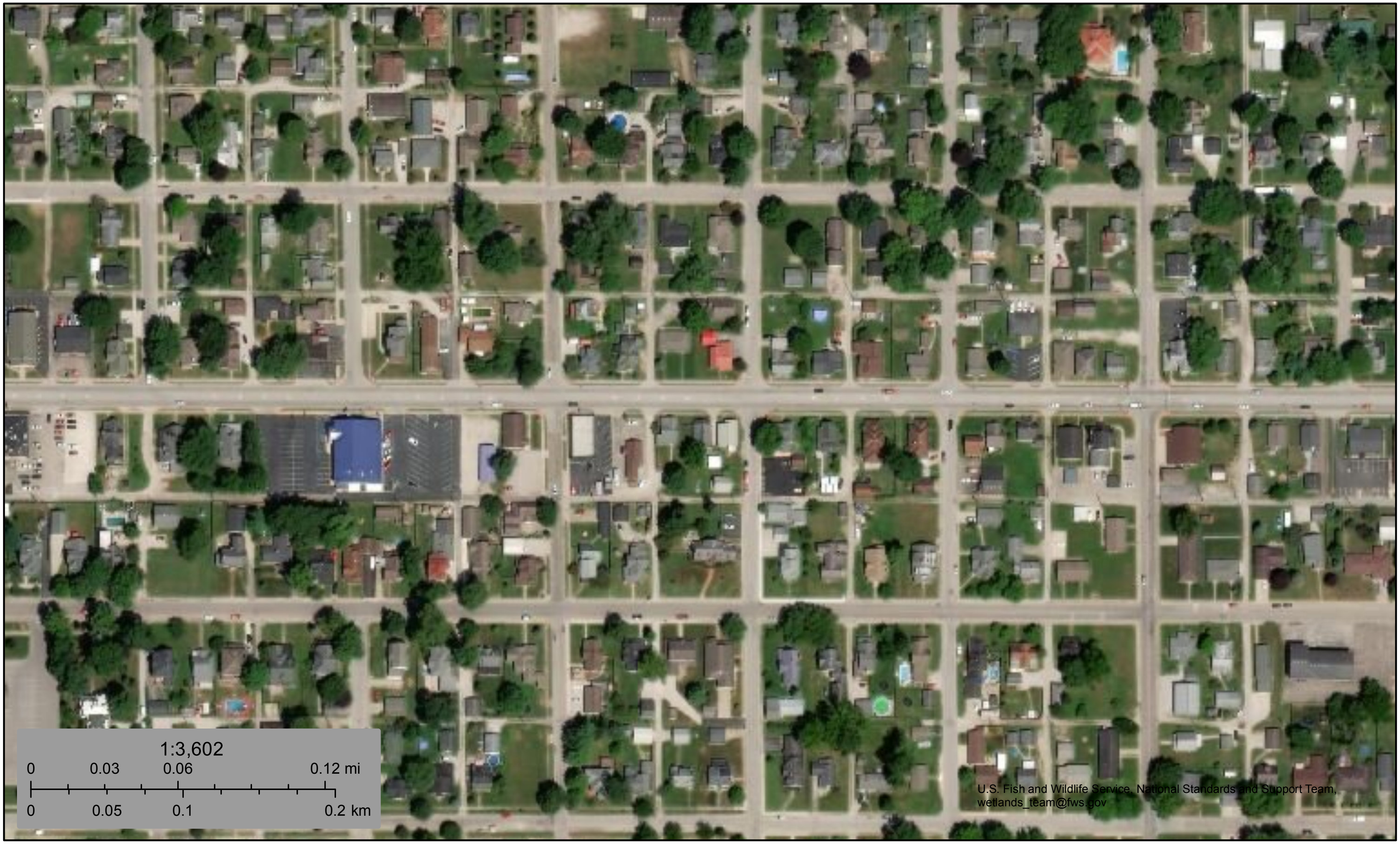
APPENDIX N

Wetlands Inventory Map

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands



September 19, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX O

IDNR ETR Determination Letter

Division of Nature Preserves
402 W. Washington St., Rm W267
Indianapolis, IN 46204-2739

September 7, 2018

Jozef Pichtel
Staff Data / GIS Analyst
Wilcox Environmental Engineering, Inc.
1552 Main St. Suite 100
Speedway, Indiana 46224

Dear Jozef Pichtel:

I am responding to your request for information on the endangered, threatened, or rare (ETR) species, high quality natural communities, and natural areas for a project located at 833 East Morgan Street, T12N, R1E, SWQ Section 34, Martinsville, Morgan County, Indiana. The Indiana Natural Heritage Data Center has been checked and there are no ETR species and significant areas documented within 0.5 mile of the project area.

The information I am providing does not preclude the requirement for further consultation with the U.S. Fish and Wildlife Service as required under Section 7 of the Endangered Species Act of 1973. If you have concerns about potential Endangered Species Act issues you should contact the Service at their Bloomington, Indiana office.

U.S. Fish and Wildlife Service
620 South Walker St.
Bloomington, Indiana 47403-2121
(812)334-4261

At some point, you may need to contact the Department of Natural Resources' Environmental Review Coordinator so that other divisions within the department have the opportunity to review your proposal. For more information, please contact:

Department of Natural Resources
Attn: Christie Stanifer
Environmental Coordinator
Division of Fish and Wildlife
402 W. Washington Street, Room W273
Indianapolis, IN 46204
(317)232-8163

Please note that the Indiana Natural Heritage Data Center relies on the observations of many individuals for our data. In most cases, the information is not the result of comprehensive field surveys conducted at particular sites. Therefore, our statement that there are no documented significant natural features at a site should not be interpreted to mean that the site does not support special plants or animals.

Due to the dynamic nature and sensitivity of the data, this information should not be used for any project other than that for which it was originally intended. It may be necessary for you to request updated material from us in order to base your planning decisions on the most current information.

Thank you for contacting the Indiana Natural Heritage Data Center. You may reach me at (317)232-3517 you have any questions or need additional information.

Sincerely,

Teresa Clark

Teresa L. Clark
Indiana Natural Heritage Data Center

Enclosure: Invoice

APPENDIX P

Pilot Test Summary Report

Indianapolis, IN
Ft. Wayne, IN
Evansville, IN
Cincinnati, OH

WILCOX
ENVIRONMENTAL ENGINEERING

CORPORATE OFFICE
1552 Main Street, Suite 100
Speedway, IN 46224
phone 317.472.0999
www.wilcoxenv.com

Pilot Test Report

Former O'Neal's Clothes Depot Cleaners
Martinsville, Indiana
State Cleanup #0000402

Wilcox Project # 341.14

January 7, 2019

Prepared for:

Mr. John O'Neal
c/o Mr. David L. Guevara Ph.D.
Taft Stettinius & Hollister LLP
One Indiana Square, Suite 3500
Indianapolis, Indiana 46204-2023

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FIGURES

APPENDICES

1.0 Introduction

On behalf of the former O'Neal's Clothes Depot Cleaners ("O'Neal's"), Wilcox Environmental Engineering, Inc. ("Wilcox") has prepared this Pilot Test Report to document the *in-situ* chemical reduction ("ISCR") injection activities completed at the former O'Neal's facility located at 833 East Morgan Street, Martinsville, Indiana (the "Site") by Wilcox and Regenesis Remediation Services ("Regenesis") in July and August 2018. The Regenesis application summary report is included in **Appendix A**.

The pilot test consisted of injecting Hydrogen Release Compound® ("HRC"), Bio-Dechlor INOCULUM® PLUS ("BDI"), calcium chloride ("CaCl"), and PlumeStop™ ("PlumeStop") into the saturated zone to stimulate anaerobic dehalogenation of tetrachloroethene ("PCE") and its metabolites. The efficacy of this approach was evaluated with groundwater monitoring before and 30 days after the pilot test in the vicinity of MW-09 and MW-10 positioned near the area of highest dissolved concentrations (**Figure 1**). This document presents the results of the Pilot Test.

2.0 Site Conditions

Groundwater Flow Direction

The approximate potentiometric surface and groundwater flow direction in August 2018 is depicted on **Figure 2**. Groundwater flows generally to the west-southwest from a peak elevation at MW-03 located on the eastern portion of the Site property. The flow pattern gradually changes to west and then northwest downgradient of the Site investigation area near the Pike and Mulberry National Priority List ("NPL") MW-04S location. A consistent northwest groundwater flow direction associated with the NPL investigation has been described previously by others and is reportedly connected to the City of Martinsville municipal well field operations located approximately 0.86-mile northwest of the site. A west-southwest groundwater flow direction toward the White River located approximately 2.2 miles to the west would be expected without the reported hydraulic influence exerted by the municipal supply wells observed beyond the distal end of the dissolved plume near NPL MW-04S.

Groundwater Gradients

Groundwater elevations, well locations, and well screen intervals were used to calculate horizontal and vertical gradients. The average horizontal gradient calculated for August 2018 is 0.006 foot/foot. Horizontal gradients are moderately steeper in the eastern portion of the investigation area and flatten out down-gradient toward the distal end of the dissolved plume. For example, the horizontal gradient in the eastern portion of the investigation area averages approximately 0.006 foot/foot between MW-3 and MW-15 compared with 0.005 foot/foot between MW-16 to MW-20. Horizontal gradients continue to show minimal seasonal variations. Vertical gradients were calculated to evaluate the vertical component of groundwater flow using the shallow-deep well pairs MW-09/MW-09D and MW-15/MW-15D. A positive vertical gradient indicates that the groundwater flow is upward from the lower well toward the upper well while a negative vertical gradient indicates the flow is downward from the upper well to the lower well. The August 2018 vertical gradients calculated at MW-09/MW-09D and MW-15/MW-15D pair are -0.003 foot/foot and 0.002 foot/foot, respectively.

Groundwater VOCs Concentrations

Groundwater at the Site is impacted by PCE related to a release of dry-cleaning solvent. No degradation products are currently present. The release source is suspected to be the sanitary sewer system located at and southwest of the Site. Sewer camera investigation activities identified sewer line fractures west of the Site where chlorinated volatile organic compounds ("cVOCs") were likely introduced into the subsurface. PCE concentrations exceeding the Indiana Department of Environmental Management's ("IDEM's") *Remediation Closure Guide* ("RCG") residential groundwater tap screening level ("RGWSL") and/or RCG residential vapor intrusion groundwater screening level ("RVIGSWL") are located at and southwest of the Site and are adequately defined. **Figure 3** depicts the general extent of PCE in groundwater at the Site investigation area. The dissolved PCE plume exceeding the RGWSL extends from the Site property down-gradient to the west-southwest approximately 1,800 feet. Groundwater samples analyzed from 20 monitoring wells in August 2018 had PCE concentrations above the RGWSL of 5 micrograms per liter (μg/L), three of which also exceeded the RVIGWSL of 110 μg/L. No PCE concentrations exceeded the industrial vapor intrusion screening level. Cumulative groundwater data are summarized in **Table 1**.

Pre-Pilot Test Baseline Groundwater Monitoring

Baseline groundwater samples were collected in July 2018 from a subset of 12 monitoring wells positioned at optimal locations in order to evaluate pilot test performance. Groundwater samples were collected from performance wells using low-flow methods consisting of a down-hole pump fitted with new disposable polyethylene tubing at each location. Non-dedicated down-hole equipment was decontaminated after each use with a soft scrubber and phosphate-free detergent and water solution, and triple-rinsed with distilled water. Water quality parameter probes and flow-through cells were triple-rinsed with distilled water after each use. Groundwater was extracted from each accessible well maintaining a minimum discharge of 100 milliliters a minute (mL/min) while minimizing drawdown. Groundwater parameters (dissolved oxygen, conductivity, pH, temperature, oxidation-reduction potential, and turbidity) were continuously recorded during groundwater extraction to determine stability and collect representative groundwater samples. Groundwater was considered "stable" and ready for sample collection after field parameters indicated minimal variation for three consecutive readings. The field parameter stability data are provided on the groundwater monitoring forms in **Appendix B**.

Samples were labeled, placed in an ice filled cooler maintained at $4^oC \pm 2^oC$, and submitted under chain-of-custody protocol to Pace Analytical Services of Indianapolis, Indiana for analysis of volatile organic compounds ("VOCs") via United States Environmental Protection Agency ("USEPA") Method 8260. Additional samples were collected from the well subset to evaluate aquifer geochemistry including nitrate/nitrite, total and dissolved manganese and iron, sulfate, biological oxygen demand ("BOD"), chemical oxygen demand

("COD"), alkalinity, methane, ethane, and ethene. The laboratory analytical reports and chain-of-custody forms are provided in **Appendix C**.

3.0 Pilot Test Work Scope

Wilcox implemented the ISCR pilot test from July 30 to August 3, 2018 along the centerline of the dissolved plume southwest of the Site property at the locations depicted on **Figure 1**. PlumeStop, BDI, CaCl, and HRC were injected into a series of injection points in the area. PlumeStop, a proprietary remediation product manufactured by Regenesis, contains very fine particles (1-2 micrometers) of activated carbon suspended in water via organic polymer dispersion chemistry. Once in the subsurface, the material behaves as a colloidal biomatrix binding to the aquifer matrix, rapidly removing contaminants from groundwater via binding to the biomatrix and expediting permanent contamination biodegradation unhindered by groundwater advection mechanics. BDI is a product, also marketed by Regenesis, that is an enriched, natural microbial consortium containing species of *Dehalococcoides* sp. ("DHC"), capable of completely dechlorinating contaminants during *in-situ* anaerobic bioremediation processes. CaCl is used as a "parking" solution for PlumeStop barriers when groundwater movement is above average. Upon contact with PlumeStop, the material binds particles of the activated carbon together (10-20 µm), slowing or stopping their movement through the aquifer increasing barrier placement and efficacy. HRC, another remediation product manufactured by Regenesis, is an engineered, hydrogen release compound designed specifically for enhancing *in-situ* anaerobic bioremediation of chlorinated compounds in groundwater or highly saturated soils.

Injection Application

The pilot test consisted of a series of injection points in alleys near MW-09 and MW-10 at the locations depicted on **Figure 1**. Two rows of 16 injection points oriented north to south were positioned in the alley beginning at the MW-09/MW-9D location and extending north to the west-east adjacent alley. The injection points were staggered in an offset pattern on opposite sides of the alley. A third row of three injection points was positioned east of MW-10. A total of 400 lbs. of HRC, 18 liters of BDI, 4,067 lbs. of PlumeStop, and 2,000 lbs. of CaCl was injected across a seven-feet treatment interval (9-16 feet bgs) during the pilot test. The volume of each injectant varied according to location, design purpose, and minor surfacing observed at some locations. Details regarding volume, pressure, flow rate, and comments specific to each injection location are included in **Appendix A**.

HRC, BDI, and a solution of PlumeStop and CaCl were injected at each location in the downgradient row positioned along the west side of the alley flanking MW-09/MW-09D, and at one location near MW-10. The boring locations are identified as IP-1 through IP-9 and are depicted on **Figure 1**. The initial design dosage for IP-1 through IP-9 was 333 gallons of a solution containing PlumeStop and CaCl, 22.2 lbs. of HRC, and 1.0 L of BDI per location. IP-4 was abandoned after approximately 90% of the design volume was injected and minor surfacing was observed. The remaining volume was applied to IP-3.

HRC, BDI, PlumeStop, and CaCl were injected at each location in the upgradient row positioned along the east side of the alley near MW-09/MW-09D, and in the row adjacent to

MW-10. The borings are identified on **Figure 1** as IP-9 through IP-19. A total of 333 gallons of PlumeStop, 22.2 lbs. of HRC, 222 gallons of CaCl, and 1 L of BDI were applied at each location with some variation due to surfacing at IP-13 and IP-16 after approximately 65% of the intended volume was applied. The remaining volume was distributed at IP-15, IP-17, and IP-19.

The following procedure was followed during injection activities:

1. Surface or overhead impediments and underground structures were identified prior to the injections. Underground structures included utility lines and sewers. The planned injection locations were adjusted to account for impediments and obstacles.
2. The direct push unit was set up over each pre-marked point with consideration that borings remained vertical during the injection process.
3. HRC was applied undiluted at each location.
4. BDI was co-applied utilizing slip-stream technology while injecting the solution.
5. PlumeStop was mixed with CaCl for application at IP-1 through IP-9 or mixed with water at IP-10 through IP-19.
6. CaCl was mixed with PlumeStop as described in step 5, or with water and applied as an offset injection point at IP-10 through IP-19.
7. A bottom-up injection method was employed to distribute the injectant over the target vertical interval. This method utilizes an expendable point and retractable screen at the terminus of the drive rod assembly.
8. After the drive rods had been pushed to 16 feet, the rod assembly was withdrawn three to six inches to enable the expendable tip to be dropped from the drive rods.
9. The delivery hose was connected to the pump outlet and the drive rods. After confirming that the connections were secure, the injectant was pumped through the delivery system into the subsurface starting at the bottom of the injection interval.
10. The drive rods were withdrawn at three-foot intervals (e.g., 10 to 13 feet, and 13 to 16 feet), and a one-foot interval from 9 to 10 feet at the top of the treatment zone. The pre-determined volume of solution was equally distributed across the interval. Deviations from this injection schedule were noted in the field book along with a reason for the change.
11. While removing drive rods, the pump was turned off to allow the pressure to bleed off, and then the length of drive rod was removed, the delivery hose reconnected, and the injection resumed as described above.
12. Volumetric application rates and injection pressures were monitored using in-line flow meters and pressure gauges installed at each delivery line. Regenesis recorded readings for flow rate and injection pressures throughout the pilot test. Once the injection was completed and rods withdrawn, injection points were sealed using granular bentonite to the top of the boring.
13. Observations were made for any indications of aquifer refusal or "surfacing" around the injection rods or previously installed injection points. If subsurface acceptance appeared to be low or surfacing occurred, the injection rate was reduced.
14. The above steps were repeated until treatment of the entire vertical zone was achieved, with the drive rods cleaned as necessary.
15. An appropriate seal, such as bentonite, was installed in the open borehole when injection for that boring was completed and the drill rods removed. Each borehole

was sealed immediately following the reagent application to minimize surfacing during subsequent injection processes.

16. The mobile rig was moved to the next probe point, repeating the above steps.

Post Pilot Test Performance Monitoring

Follow-up groundwater sampling and analysis was performed 30-days after the pilot test was conducted on August 28-29, 2018 at the monitoring well subset utilized for the baseline data collection described in the above sections. Groundwater samples were collected for the same parameters utilizing consistent methods. Field data are included on the groundwater monitoring forms in **Appendix B**, and the laboratory analytical reports and chain-of-custody forms are provided in **Appendix C**.

4.0 Pilot Test Results

Groundwater VOCs Results

ISCR performance data is summarized in **Table 2** and is depicted on **Figure 4**. The July 30-31, 2018 analytical results were utilized as a pre-injection baseline against which to compare the post-injection data collected August 28-29, 2018. The results of the VOCs laboratory analysis are as follows:

- August 2018 PCE concentrations decreased from the July 2018 pre-injection concentrations at MW-09, MW-09D, MW-10, and MW-15. Of note, the PCE concentration at MW-09 decreased from 291 μg/L in July 2018 to non-detect.
- Minimal PCE concentration increases were reported at MW-08, MW-16, MW-17, MW-19, MW-24, and MW-26 within the seasonal fluctuation average at each location. Each of these wells are positioned further from the pilot study area and no noticeable effect was apparent in the 30-day post sampling event VOC results.
- No other VOCs were detected in any of the post-injection groundwater samples.

Overall, the groundwater analytical results for monitoring well MW-09 indicate that the pilot test was successful. The PCE concentration at MW-09, which ranged from a low of 80.3 μg/L (May 2017) to a high of 376 μg/L (September 2016), is currently at non-detect.

Groundwater Geochemical Parameter Results

The July and August 2018 aquifer geochemistry was evaluated to provide additional lines of evidence to determine pilot test performance. The data are summarized in **Table 2** and depicted on **Figure 4**. The results are as follows:

- There was a steady increasing trend toward alkaline conditions during the pilot test period. A slight increase in groundwater pH in August 2018 was documented at wells within the 30-day zone of influence. Groundwater pH was measured at 7.06 and 6.98 standard units pre-treatment at MW-09 and MW-10, respectively, and increased to 7.47 and 7.27 standard units post-treatment. This trend is also reflected in the alkalinity samples collected at MW-09 and MW-10 with increases from 280 milligrams per liter ("mg/L") and 283 mg/L pre-treatment to 297 mg/L and 520 mg/L, respectively. There is a positive correlation between zones of increased alkalinity and microbial activity. An increase in alkalinity with relatively stable pH generally indicates the buffering capacity of the aquifer is sufficient to neutralize metabolic acids generated during both biodegradation of organic compounds.

- No trend was apparent for specific conductance ("SC") in the performance wells. SC was measured for MW-09 at 0.927 milli-Seimens per centimeter ("mS/cm") pre-treatment and slightly increased to 1.080 mS/cm post- treatment. Conversely, SC decreased at MW-10 from 1.220 mS/cm in July 2018 to 1.110 mS/cm in August 2018. SC values at the remaining performance wells were within the range of normal seasonal fluctuations with no apparent trend.
- The bacteria responsible for anaerobic degradation of chlorinated hydrocarbons generally cannot function in environments with dissolved oxygen ("DO") concentrations greater than 0.5 to 1.0 mg/L. A significant post-treatment decreasing DO trend was present at many of the performance wells. The pre-treatment DO concentrations at MW-09 and MW-10 were measured at 6.21 and 7.64 mg/L, respectively, and decreased to 0.00 mg/L post-treatment at each location. Decreases in DO were also reported at other performance wells during post-treatment sampling, except for MW-09D which increased from 0.71 mg/L to 2.74 mg/L.
- The oxidation-reduction potential ("ORP") of groundwater is a measure of electron activity and is an indicator of the relative tendency of a solution to accept or transfer electrons. Used in conjunction with other geochemical parameters, ORP indicates which terminal electron accepting processes predominate in an aerobic environment. The ORP at MW-09 was 132 millivolts ("mV") pre-treatment and decreased to 12 mV post-treatment. ORP decreases were also reported at MW-08 (154 mV to 102 mV), MW-09D (130 mV to -17 mV), MW-10 (119 mV to -77 mV), MW-11 (146 mV to 106 mV), and MW-15D (142 mV to 117 mV).
- Depleted levels of nitrate relative to background concentrations generally indicates the aquifer is sufficiently reducing to sustain nitrate reduction forming nitrite as a byproduct. A nitrate concentration decrease corresponding with an associated nitrite increase was present at MW-09, MW-10, and MW-15D indicating nitrate was being utilized as an electron acceptor and denitrification was likely occurring.
- In some instances, Fe(III) and manganese (IV) are used as electron acceptors during anaerobic biodegradation of organic carbon, but typically are present in solid mineral form. During this process, Fe(III) is reduced to Fe(II), which is soluble in water. Similarly, Mn(IV) is reduced to soluble Mn(II). Fe(II) and Mn(II) concentrations can thus be used as indicators of anaerobic biodegradation. Concentration increases in Mn(II) (analyzed as dissolved manganese) were reported at MW-09, MW-09D, and MW-10 indicating that conditions were favorable for manganese reduction. Fe(II) was not reported above the laboratory detection level.
- BOD may be used as an indication of electron acceptor demand, and COD may be used as an indication of substrate electron acceptor demand. BOD was not detected in the August 2018 samples. COD was not detected in the July 2018 samples, and was reported at MW-09 (66 mg/L), MW-09D (20.7 mg/L), and MW-10 (75.7 mg/L) in the August 2018 data set representing an increasing substrate load in groundwater

after the ISCR injections occurred.

- There was a slight increase in the ethene concentration between July and August 2018 at MW-15D from non-detect to 12.60 µg/L. Ethene is an end product resulting from the complete dehalogenation of chlorinated alkenes and is therefore an indicator of biological activity.
- Ethane was not detected in either the July or the August 2018 samples.
- During methanogenesis, acetate is split to form carbon dioxide and methane, or carbon dioxide is used as an electron acceptor and is reduced to methane. There was a relatively moderate increase in methane at MW-09, MW-10, and MW-15D between July and August 2018, from non-detect at each location to 11.60 µg/L, 34.10 µg/L, and 10.10 mg/L, respectively. This is not unexpected as methanogenic processes are typically more responsive to HRC injection compared to other dechlorinating microbial processes. Despite the relatively moderate methane concentration increases, the concentration remains low.

The pilot test injections appear to have created a slightly more alkaline, more oxygen-poor reducing environment, which was expected and desired to stimulate anaerobic biodegradation.

5.0 Conclusions

The PCE concentration at monitoring well MW-09 has experienced a significant reduction since the injections occurred in August 2018. Therefore, the Pilot Test is considered a success and Wilcox recommends proceeding with full-scale ISCR treatment as proposed in the RWP.

TABLES

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[1] (feet below TOC)	Groundwater Elevation[2] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-01	98.57	6-16	01/23/2015	N	10.90	87.67	**53.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-01	98.57	6-16	01/23/2015	FD	10.90	87.67	**61**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-01	98.57	6-16	04/21/2015	N	9.93	88.64	**40.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	98.57	6-16	09/28/2015	N	9.88	88.69	**60.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	02/04/2016	WLO	11.02	600.72	Gauged Only									
MW-01	611.74	6-16	09/14/2016	N	10.34	601.40	**65.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	09/14/2016	FD	10.34	601.40	**61.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	11/22/2016	N	11.12	600.62	**26.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	02/03/2017	N	10.71	601.03	**8.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	05/03/2017	N	10.05	601.69	**11.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	09/19/2017	N	10.10	601.64	**31.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	12/06/2017	N	10.87	600.87	**12.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	03/21/2018	N	9.97	601.77	**32.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	05/30/2018	N	8.94	602.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-01	611.74	6-16	08/29/2018	N	10.22	601.52	**37.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	99.99	6-16	01/23/2015	N	12.10	87.89	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-02	99.99	6-16	04/06/2015	WLO	11.48	88.51	Gauged Only									
MW-02	99.99	6-16	09/28/2015	N	11.02	88.97	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	02/04/2016	WLO	12.25	600.90	Gauged Only									
MW-02	613.15	6-16	09/12/2016	N	11.55	601.60	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	11/21/2016	N	12.41	600.74	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	02/01/2017	N	11.89	601.26	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	05/02/2017	N	11.35	601.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	09/18/2017	N	11.26	601.89	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	12/05/2017	N	12.20	600.95	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	03/19/2018	N	11.10	602.05	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	05/29/2018	N	9.98	603.17	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-02	613.15	6-16	08/27/2018	N	11.42	601.73	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	99.14	6-16	01/23/2015	N	11.10	88.04	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.4	< 5.0	< 5.0	< 5.0	< 100
MW-03	99.14	6-16	04/06/2015	WLO	10.47	88.67	Gauged Only									
MW-03	99.14	6-16	09/28/2015	N	10.05	89.09	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	02/04/2016	WLO	11.25	601.08	Gauged Only									
MW-03	612.33	6-16	09/13/2016	N	10.54	601.79	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	11/21/2016	N	11.32	601.01	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	02/02/2017	N	10.91	601.42	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	05/03/2017	N	10.27	602.06	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	09/18/2017	N	10.27	602.06	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	12/05/2017	N	11.20	601.13	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	03/19/2018	N	10.15	602.18	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	05/29/2018	N	9.06	603.27	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-03	612.33	6-16	08/28/2018	N	10.40	601.93	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	98.32	6-16	04/06/2015	N	10.15	88.17	**30.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	98.32	6-16	09/28/2015	N	9.78	88.54	**26.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[1] (feet below TOC)	Groundwater Elevation[2] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-04	611.47	6-16	02/04/2016	WLO	10.93	600.54	Gauged Only									
MW-04	611.47	6-16	09/14/2016	N	10.26	601.21	**32.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	11/22/2016	N	NA	NA	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	02/03/2017	N	10.60	600.87	**5.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	05/03/2017	N	9.91	601.56	**7.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	09/19/2017	N	10.00	601.47	**12.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	12/06/2017	N	11.03	600.44	**6.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	03/20/2018	N	9.87	601.60	**8.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	05/30/2018	N	8.85	602.62	**25.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-04	611.47	6-16	08/29/2018	N	10.11	601.36	**5.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	98.60	6-16	04/06/2015	N	10.12	88.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	98.60	6-16	04/06/2015	FD	10.12	88.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	98.60	6-16	09/28/2015	N	9.77	88.83	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	02/04/2016	WLO	10.90	600.87	Gauged Only									
MW-05	611.77	6-16	09/12/2016	N	10.19	601.58	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	11/21/2016	N	10.97	600.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	02/02/2017	N	10.55	601.22	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	05/03/2017	N	9.87	601.90	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	09/18/2017	N	9.98	601.79	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	12/05/2017	N	10.83	600.94	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	03/19/2018	N	9.85	601.92	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	05/30/2018	N	8.84	602.93	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-05	611.77	6-16	08/28/2018	N	10.08	601.69	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	97.56	6-16	04/06/2015	N	10.10	87.46	**119**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	97.56	6-16	09/28/2015	N	9.66	87.90	**142**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	97.56	6-16	09/28/2015	FD	9.66	87.90	**150**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	02/04/2016	WLO	10.82	600.04	Gauged Only									
MW-06	610.86	6-16	09/14/2016	N	10.13	600.73	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	11/23/2016	N	10.94	599.92	**81.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	02/03/2017	N	10.50	600.36	**85.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	05/04/2017	N	9.66	601.20	**78.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	09/20/2017	N	9.89	600.97	**108**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	12/07/2017	N	10.77	600.09	**87.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	03/21/2018	N	9.70	601.16	**69.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	05/31/2018	N	8.75	602.11	**83.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-06	610.86	6-16	08/30/2018	N	10.02	600.84	**100**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	97.03	6-16	09/28/2015	N	9.51	87.52	**8.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	02/04/2016	WLO	10.64	599.71	Gauged Only									
MW-07	610.35	6-16	09/13/2016	N	9.94	600.41	**12.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	11/22/2016	N	10.69	599.66	**7.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	02/02/2017	N	10.20	600.15	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	05/03/2017	N	9.64	600.71	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[(1)] (feet below TOC)	Groundwater Elevation[(2)] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-07	610.35	6-16	09/18/2017	N	9.70	600.65	**7.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	12/05/2017	N	10.60	599.75	**6.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	03/19/2018	N	9.55	600.80	**5.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	05/30/2018	N	8.60	601.75	**8.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-07	610.35	6-16	08/28/2018	N	9.84	600.51	**14.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	97.52	6-16	09/28/2015	N	9.95	87.57	**65.7**	< 5.0	18.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	02/04/2016	WLO	11.16	599.70	Gauged Only									
MW-08	610.86	6-16	09/14/2016	N	10.41	600.45	**88.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	09/14/2016	FD	10.41	600.45	**75.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	11/23/2016	N	11.17	599.69	**61.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	02/03/2017	N	10.72	600.14	**18.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	05/03/2017	N	10.15	600.71	**31.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	09/19/2017	N	10.15	600.71	**66.5**	< 5.0	5.5	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	12/07/2017	N	10.71	600.15	**116**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	03/21/2018	N	9.99	600.87	**81.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	05/31/2018	N	9.04	601.82	**52.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	07/31/2018	N	10.20	600.66	**67.8**	< 5.0	9.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-08	610.86	6-16	08/28/2018	N	10.30	600.56	**84.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	97.48	6-16	09/28/2015	N	10.77	86.71	**276**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/04/2016	WLO	11.96	598.85	Gauged Only									
MW-09	610.81	6-16	09/14/2016	N	11.26	599.55	**376**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	11/23/2016	N	12.00	598.81	**310**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	11/23/2016	FD	12.00	598.81	**350**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/03/2017	N	11.61	599.20	**145**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	02/03/2017	FD	11.61	599.20	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	05/04/2017	N	11.05	599.76	**80.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	09/20/2017	N	10.96	599.85	**293**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	12/07/2017	N	11.56	599.25	**329**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	03/21/2018	N	10.88	599.93	**290**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	05/31/2018	N	9.82	600.99	**245**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	07/30/2018	N	11.00	599.81	**291**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09	610.81	6-16	08/29/2018	N	11.15	599.66	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	09/20/2017	N	11.10	599.79	**58.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	12/07/2017	N	11.85	599.04	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	03/21/2018	N	11.02	599.87	**31.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	05/31/2018	N	9.99	600.90	**78.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	07/30/2018	N	11.17	599.72	**82.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-09D	610.89	32.5-37.5	08/29/2018	N	11.30	599.59	**10.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	97.88	6-16	09/28/2015	N	10.95	86.93	**33**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	02/04/2016	WLO	12.19	599.01	Gauged Only									
MW-10	611.20	6-16	09/14/2016	N	11.49	599.71	**28.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[1] (feet below TOC)	Groundwater Elevation[2] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-10	611.20	6-16	11/22/2016	N	12.21	598.99	**20.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	02/02/2017	N	11.83	599.37	**17.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	05/03/2017	N	11.34	599.86	**11.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	09/19/2017	N	11.16	600.04	**17.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	12/07/2017	N	11.92	599.28	**21.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	03/21/2018	N	11.03	600.17	**14.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	05/31/2018	N	9.99	601.21	**17.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	07/30/2018	N	11.25	599.95	**15.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-10	611.20	6-16	08/28/2018	N	11.39	599.81	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	02/04/2016	N	12.71	598.09	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	09/13/2016	N	11.95	598.85	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	11/21/2016	N	12.70	598.10	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	02/02/2017	N	12.35	598.45	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	05/03/2017	N	11.88	598.92	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	09/18/2017	N	11.64	599.16	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	12/05/2017	N	12.65	598.15	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	03/19/2018	N	11.49	599.31	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	05/30/2018	N	10.40	600.40	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	07/31/2018	N	11.37	599.43	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-11	610.80	6-16	08/28/2018	N	11.90	598.90	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	02/04/2016	N	10.26	599.50	**10.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	09/14/2016	N	9.63	600.13	**9.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	11/22/2016	N	11.37	598.39	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	02/02/2017	N	9.91	599.85	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	05/03/2017	N	9.17	600.59	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	09/18/2017	N	9.40	600.36	**7.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	12/05/2017	N	10.28	599.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	03/19/2018	N	9.26	600.50	**5.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	05/30/2018	N	8.32	601.44	**9.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-12	609.76	6-16	08/28/2018	N	9.52	600.24	**15.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	02/04/2016	N	10.90	598.42	**13.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	09/13/2016	N	10.19	599.13	**19.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	11/22/2016	N	10.94	598.38	**21.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	02/02/2017	N	10.50	598.82	**14.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	05/03/2017	N	9.85	599.47	**16.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	09/19/2017	N	9.95	599.37	**13.1**	< 5.0	10.4	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	12/07/2017	N	10.90	598.42	**16.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	03/20/2018	N	9.85	599.47	**19.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	05/30/2018	N	8.85	600.47	**18.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-13	609.32	6-16	08/29/2018	N	10.11	599.21	**21.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	02/05/2016	N	10.62	597.43	**9.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water(1) (feet below TOC)	Groundwater Elevation(2) (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-14	608.05	6-16	09/13/2016	N	9.90	598.15	**14.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	11/22/2016	N	10.66	597.39	**13.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	02/02/2017	N	10.26	597.79	**10.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	05/03/2017	N	9.67	598.38	**10.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	09/19/2017	N	9.66	598.39	**12.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	12/06/2017	N	10.55	597.50	**11.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	03/20/2018	N	9.59	598.46	**9.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	05/30/2018	N	8.50	599.55	**10.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-14	608.05	6-16	08/29/2018	N	9.88	598.17	**14.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/05/2016	N	10.72	597.38	**178**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/05/2016	FD	10.72	597.38	**202**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	09/14/2016	N	10.06	598.04	**207**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	11/23/2016	N	10.78	597.32	**224**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	02/03/2017	N	10.40	597.70	**233**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/04/2017	N	9.70	598.40	**195**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/04/2017	FD	9.70	598.40	**212**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	09/20/2017	N	9.72	598.38	**156**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	09/20/2017	FD	9.72	598.38	**142**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	12/07/2017	N	10.71	597.39	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	12/07/2017	FD	10.71	597.39	**119**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	03/21/2018	N	10.66	597.44	**121**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	03/21/2018	FD	10.66	597.44	**97.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/31/2018	N	9.00	599.10	**154**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	05/31/2018	FD	9.00	599.10	**144**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	07/30/2018	N	9.80	598.30	**165**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	08/30/2018	N	9.99	598.11	**128**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15	608.10	6-16	08/30/2018	FD	9.99	598.11	**132**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	09/20/2017	N	9.90	598.29	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	12/07/2017	N	10.86	597.33	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	03/21/2018	N	9.80	598.39	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	05/31/2018	N	8.75	599.44	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	07/30/2018	N	9.95	598.24	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-15D	608.19	30-35	08/30/2018	N	10.12	598.07	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	02/04/2016	N	12.13	596.75	**19.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	09/14/2016	N	11.48	597.40	**16.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	11/22/2016	N	12.20	596.68	**21.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	02/03/2017	N	11.78	597.10	**18.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	05/04/2017	N	11.26	597.62	**15.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	09/19/2017	N	11.15	597.73	**11.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	12/06/2017	N	11.59	597.29	**24.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	03/21/2018	N	11.13	597.75	**12.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	05/31/2018	N	10.00	598.88	**9.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water(1) (feet below TOC)	Groundwater Elevation(2) (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-16	608.88	6-16	07/31/2018	N	11.29	597.59	**18.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-16	608.88	6-16	08/29/2018	N	11.44	597.44	**20.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	02/05/2016	N	11.39	596.12	**21.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	09/14/2016	N	10.75	596.76	**33.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	11/22/2016	N	11.44	596.07	**17.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	02/03/2017	N	11.03	596.48	**13.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	05/03/2017	N	10.62	596.89	**13.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	09/19/2017	N	10.35	597.16	**24.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	12/06/2017	N	11.19	596.32	**20.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	03/20/2018	N	10.38	597.13	**16.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	05/30/2018	N	9.08	598.43	**25.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	07/30/2018	N	11.30	596.21	**16.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-17	607.51	6-16	08/28/2018	N	10.69	596.82	**26.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	02/05/2016	N	13.70	592.77	**19.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	09/13/2016	N	13.24	593.23	**25.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	11/22/2016	N	13.88	592.59	**26.4**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	02/02/2017	N	13.53	592.94	**32.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	05/04/2017	N	13.01	593.46	**39.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	09/20/2017	N	12.85	593.62	**16.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	12/07/2017	N	13.97	592.50	**26.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	03/21/2018	N	12.98	593.49	**12.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	05/31/2018	N	11.51	594.96	**18.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-18	606.47	10-20	08/30/2018	N	18.30	588.17	**20.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	02/05/2016	N	14.45	593.43	**93.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	09/14/2016	N	13.92	593.96	**104**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	11/23/2016	N	14.58	593.30	**119**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	02/03/2017	N	14.20	593.68	**96.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	05/04/2017	N	13.64	594.24	**84.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	09/20/2017	N	13.54	594.34	**63.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	12/07/2017	N	14.67	593.21	**103**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	03/21/2018	N	13.63	594.25	**46.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	05/31/2018	N	12.20	595.68	**60.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	07/30/2018	N	12.70	595.18	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-19	607.88	10-20	08/29/2018	N	18.94	588.94	**67.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	02/04/2016	N	13.70	592.05	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	09/12/2016	N	12.31	593.44	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	11/21/2016	N	13.95	591.80	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	02/01/2017	N	13.55	592.20	**61.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	05/04/2017	N	12.93	592.82	**13.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	09/20/2017	N	12.95	592.80	**9.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	12/07/2017	N	14.03	591.72	**47.6**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[1] (feet below TOC)	Groundwater Elevation[2] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-20	605.75	10-20	03/21/2018	N	12.98	592.77	**22.2**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	05/31/2018	N	12.01	593.74	**7.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-20	605.75	10-20	08/30/2018	N	13.41	592.34	**12.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	02/04/2016	N	13.25	591.55	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	09/12/2016	N	12.99	591.81	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	11/21/2016	N	13.59	591.21	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	02/01/2017	N	13.17	591.63	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	05/02/2017	N	12.55	592.25	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	09/19/2017	N	12.55	592.25	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	12/06/2017	N	13.68	591.12	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	03/20/2018	N	12.53	592.27	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	05/30/2018	N	11.19	593.61	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-21	604.80	10-20	08/28/2018	N	13.07	591.73	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	09/12/2016	N	13.77	593.17	**147**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	11/23/2016	N	14.41	592.53	**133**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	11/23/2016	FD	14.41	592.53	**107**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	02/02/2017	N	14.02	592.92	**184**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/04/2017	N	13.46	593.48	**131**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/04/2017	FD	13.46	593.48	**132**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	09/20/2017	N	13.40	593.54	**103**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	12/07/2017	N	13.64	593.30	**92.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	03/21/2018	N	13.49	593.45	**88.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	05/31/2018	N	12.09	594.85	**57.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-22	606.94	10-20	08/30/2018	N	13.83	593.11	**97.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	09/13/2016	N	14.01	593.10	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	11/21/2016	N	14.63	592.48	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	02/01/2017	N	14.22	592.89	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	05/02/2017	N	13.76	593.35	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	09/18/2017	N	13.50	593.61	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	12/06/2017	N	14.72	592.39	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	03/20/2018	N	13.60	593.51	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	05/30/2018	N	12.28	594.83	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-23	607.11	10-20	08/28/2018	N	14.07	593.04	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	09/14/2016	N	14.05	593.90	**189**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	11/23/2016	N	14.71	593.24	**154**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	02/03/2017	N	14.32	593.63	**208**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/02/2017	NA	13.87	594.08	Not Sampled									
MW-24	607.95	10-20	09/20/2017	N	14.64	593.31	**98.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	09/20/2017	FD	14.64	593.31	**89.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	12/07/2017	N	14.82	593.13	**128**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	12/07/2017	FD	14.82	593.13	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[(1)] (feet below TOC)	Groundwater Elevation[(2)] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-24	607.95	10-20	03/21/2018	N	13.77	594.18	**145**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	03/21/2018	FD	13.77	594.18	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/31/2018	N	12.35	595.60	**112**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	05/31/2018	FD	12.35	595.60	**122**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	07/30/2018	N	13.67	594.28	**79.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	08/30/2018	N	14.08	593.87	**108**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-24	607.95	10-20	08/30/2018	FD	14.08	593.87	**208**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	09/13/2016	N	15.94	594.43	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	11/21/2016	N	16.60	593.77	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	02/01/2017	N	16.21	594.16	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	05/02/2017	N	15.79	594.58	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	09/19/2017	N	15.55	594.82	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	12/06/2017	N	16.65	593.72	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	03/20/2018	N	15.65	594.72	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	05/30/2018	N	14.20	596.17	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-25	610.37	10-20	08/28/2018	N	15.97	594.40	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	09/14/2016	N	10.41	596.96	**223**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	11/21/2016	WLO	11.56	595.81	Gauged Only									
MW-26	607.37	7-17	02/03/2017	N	10.74	596.63	**146**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	02/03/2017	FD	10.74	596.63	**141**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	05/02/2017	NA	10.29	597.08	Not Sampled									
MW-26	607.37	7-17	09/20/2017	N	10.06	597.31	**99.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	12/07/2017	N	10.87	596.50	**180**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	03/19/2018	WLO	10.36	597.01	Gauged Only									
MW-26	607.37	7-17	05/31/2018	N	8.83	598.54	**75.1**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	07/31/2018	N	10.03	597.34	**124**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-26	607.37	7-17	08/29/2018	N	10.37	597.00	**154**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	09/19/2017	N	12.50	594.57	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	12/06/2017	N	13.65	593.42	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	03/20/2018	N	12.71	594.36	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	05/30/2018	N	11.20	595.87	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-27	607.07	10-20	08/29/2018	N	12.97	594.10	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	09/19/2017	N	11.10	596.21	**11.5**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	12/06/2017	N	12.21	595.10	**11.0**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	03/20/2018	N	11.24	596.07	**10.3**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	05/30/2018	N	9.87	597.44	**11.9**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-28	607.31	10-20	08/29/2018	N	11.53	595.78	**17.8**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	09/19/2017	N	10.70	597.56	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	12/06/2017	N	11.69	596.57	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	03/20/2018	N	10.72	597.54	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water(1) (feet below TOC)	Groundwater Elevation(2) (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
MW-29	608.26	10-20	05/30/2018	N	9.53	598.73	**55.7**	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
MW-29	608.26	10-20	08/29/2018	N	11.00	597.26	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 1.7	< 5.0	< 5.0	< 5.0	< 100
NPL-MW-04B	603.54	89-99	09/18/2017	WLO	12.75	590.79	Gauged Only									
NPL-MW-04B	603.54	89-99	12/05/2017	WLO	13.80	589.74	Gauged Only									
NPL-MW-04B	603.54	89-99	03/19/2018	WLO	8.44	595.10	Gauged Only									
NPL-MW-04B	603.54	89-99	05/29/2018	WLO	8.09	595.45	Gauged Only									
NPL-MW-04B	603.54	89-99	08/27/2018	WLO	9.64	593.90	Gauged Only									
NPL-MW-04M	603.64	50-60	09/18/2017	WLO	9.32	594.32	Gauged Only									
NPL-MW-04M	603.64	50-60	12/05/2017	WLO	10.10	593.54	Gauged Only									
NPL-MW-04M	603.64	50-60	03/19/2018	WLO	8.63	595.01	Gauged Only									
NPL-MW-04M	603.64	50-60	05/29/2018	WLO	8.41	595.23	Gauged Only									
NPL-MW-04M	603.64	50-60	08/27/2018	WLO	9.77	593.87	Gauged Only									
NPL-MW-04S	603.42	8-18	09/18/2017	WLO	9.14	594.28	Gauged Only									
NPL-MW-04S	603.42	8-18	12/05/2017	WLO	9.90	593.52	Gauged Only									
NPL-MW-04S	603.42	8-18	03/19/2018	WLO	12.94	590.48	Gauged Only									
NPL-MW-04S	603.42	8-18	05/29/2018	WLO	11.28	592.14	Gauged Only									
NPL-MW-04S	603.42	8-18	08/27/2018	WLO	13.25	590.17	Gauged Only									
NPL-MW-28S	603.83	11-21	09/18/2017	WLO	13.59	590.24	Gauged Only									
NPL-MW-28S	603.83	11-21	12/05/2017	WLO	14.47	589.36	Gauged Only									
NPL-MW-28S	603.83	11-21	03/19/2018	WLO	13.22	590.61	Gauged Only									
NPL-MW-28S	603.83	11-21	05/29/2018	WLO	12.05	591.78	Gauged Only									
NPL-MW-28S	603.83	11-21	08/27/2018	WLO	14.10	589.73	Gauged Only									
NPL-MW-29S	603.98	13-23	09/18/2017	WLO	16.40	587.58	Gauged Only									
NPL-MW-29S	603.98	13-23	12/05/2017	WLO	17.24	586.74	Gauged Only									
NPL-MW-29S	603.98	13-23	03/19/2018	WLO	15.24	588.74	Gauged Only									
NPL-MW-29S	603.98	13-23	05/29/2018	WLO	14.86	589.12	Gauged Only									
NPL-MW-29S	603.98	13-23	08/27/2018	WLO	16.93	587.05	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	09/18/2017	WLO	13.65	590.10	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	12/05/2017	WLO	14.63	589.12	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	03/19/2018	WLO	13.16	590.59	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	05/29/2018	WLO	12.21	591.54	Gauged Only									
NPL-MW-32S	603.75	10.5-20.5	08/27/2018	WLO	14.11	589.64	Gauged Only									
NPL-MW-34S	603.67	13-23	09/18/2017	WLO	15.87	587.80	Gauged Only									
NPL-MW-34S	603.67	13-23	03/19/2018	NA	NA	NA	Not Sampled									
NPL-MW-34S	603.67	13-23	05/29/2018	WLO	14.47	589.20	Gauged Only									
NPL-MW-34S	603.67	13-23	08/27/2018	WLO	16.43	587.24	Gauged Only									
NPL-MW-35S	604.08	11-21	09/18/2017	WLO	12.70	591.38	Gauged Only									

Table 1. Cumulative Groundwater Analytical Data
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup #0000402

Well	TOC Elevation (feet)	Screen Interval (feet)	Date Sampled	Sample Type	Depth to Water[1] (feet below TOC)	Groundwater Elevation[2] (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Naphthalene (µg/L)	Toluene (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	Acetone (µg/L)
Residential Groundwater Tap Screening Levels							**5**	**5**	**70**	**100**	**2**	**1.7**	**1,000**	**1,000**	**2,000**	**14,000**
Residential Vapor Intrusion Groundwater Screening Levels							110	9.1	NE	NE	2.1	110	NE	NE	NE	NE
Commercial/Industrial Vapor Intrusion Groundwater Screening Levels							*470*	*38*	*NE*	*NE*	*35*	*460*	*NE*	*NE*	*NE*	*NE*
NPL-MW-35S	604.08	11-21	12/05/2017	WLO	13.64	590.44	Gauged Only									
NPL-MW-35S	604.08	11-21	03/19/2018	WLO	12.42	591.66	Gauged Only									
NPL-MW-35S	604.08	11-21	05/29/2018	WLO	11.25	592.83	Gauged Only									
NPL-MW-35S	604.08	11-21	08/27/2018	WLO	13.18	590.90	Gauged Only									
NPL-MW-36S	605.14	13-23	09/18/2017	WLO	16.50	588.64	Gauged Only									
NPL-MW-36S	605.14	13-23	12/05/2017	WLO	17.42	587.72	Gauged Only									
NPL-MW-36S	605.14	13-23	03/19/2018	WLO	16.37	588.77	Gauged Only									
NPL-MW-36S	605.14	13-23	05/29/2018	WLO	15.05	590.09	Gauged Only									
NPL-MW-36S	605.14	13-23	08/27/2018	WLO	17.23	587.91	Gauged Only									

Notes:
(1) = Depth to water measurements are collected immediately prior to sample collection. Measurements may differ from the comprehensive gauging event conducted prior to the initiation of groundwater sampling activities.
(2) = Groundwater elevations corrected for the presence of free product using an average specific gravity of 0.80.
N = Normal Field Sample
FD = Field Duplicate Sample
TOC = Top of Casing
WLO = Water Level Only
NE = Not Established
µg/L = micrograms per liter
< = Analyte not detected at the specified detection level
Screening levels obtained from IDEM's Remediation Closure Guide (RCG) Table A-6, March 22, 2012, updated 2018
Bold values exceed IDEM RCG Residential Groundwater Tap Screening Levels
Underlined values exceed IDEM RCG Residential Vapor Intrusion Groundwater Screening Levels
Italicized values exceed IDEM RCG Commercial/Industrial Vapor Intrusion Groundwater Screening Levels

Table 2. ISCR Efficacy Evaluation
O'Neal's Clothes Depot Cleaners -- Martinsville, IN
Wilcox Project Number: 341.14
State Cleanup Number: 0000402

Well Location ID	Date of Sample Collection	Time Elapsed Since Pilot Injections	Constituents of Concern						Overall Percent Reduction	Field-Measured Geochemical Parameters						Laboratory-Reported Geochemical Parameters												
			Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	trans-1,2-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	Total COCs		pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celcius)	Oxidation Reduction Potential (mV)	Turbidity (NTUs)	Nitrate (mg/L)	Nitrite (mg/L)	Total Manganese (ug/L) (Manganese IV and soluble Manganese II)	Dissolved Manganese (ug/L) (Manganese II)	Total Iron (ug/L) (Ferric - Iron III & soluble Ferrous - Iron II)	Dissolved Iron (ug/L) (Ferrous - Iron II)	Sulfate (mg/L)	Methane (ug/L)	Ethane (ug/L)	Ethene (ug/L)	Alkalinity (mg/L)	Chemical Oxygen Demand (mg/L)	Biological Oxygen Demand (mg/L)
MW-08	07/31/2018	Baseline	67.8	< 5.0	9.0	< 5.0	< 2.0	88.8	--	6.99	1.220	4.75	19.16	154	12.7	7.5	7.6	13.5	< 5.0	< 100.0	< 70.0	23.1	< 10.0	< 10.0	< 10.0	271	< 10.0	< 6.0
	08/28/2018	30 Days	84.6	< 5.0	< 5.0	< 5.0	< 2.0	102	-14.41%	7.39	0.870	3.67	28.57	102	137	7.6	< 0.50	287	< 10.0	551	< 100	23.0	< 10.0	< 10.0	< 10.0	280	< 10.0	< 12.0
MW-09	07/30/2018	Baseline	291	< 5.0	< 5.0	< 5.0	< 2.0	308	--	7.06	0.927	6.21	17.11	132	650	7.9	< 0.20	61.0	< 5.0	1,740	< 70.0	19.9	< 10.0	< 10.0	< 10.0	280	< 10.0	< 2.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	92.86%	7.47	1.080	0.00	28.68	12	108	4.6	0.37	1,780	1,680	6,800	< 100	30.8	11.6	< 10.0	< 10.0	297	66.0	< 12.0
MW-09D	07/30/2018	Baseline	82.4	< 5.0	< 5.0	< 5.0	< 2.0	99.4	--	6.97	0.808	0.71	15.72	130	16.5	1.6	< 0.10	13.8	< 5.0	480	< 70.0	18.5	< 10.0	< 10.0	< 10.0	350	< 10.0	2.0
	08/29/2018	30 Days	10.6	< 5.0	< 5.0	< 5.0	< 2.0	27.6	72.23%	7.21	0.696	2.74	27.29	-17	181	0.45	< 0.10	418	197	3,620	< 100	24.2	< 10.0	< 10.0	< 10.0	391	20.7	< 12.0
MW-10	07/30/2018	Baseline	15.2	< 5.0	< 5.0	< 5.0	< 2.0	32.2	--	6.98	1.220	7.64	18.84	119	9.2	11.4	< 1.0	53.0	< 5.0	1,260	< 70.0	37.3	< 10.0	< 10.0	< 10.0	283	< 10.0	< 2.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	31.68%	7.27	1.110	0.00	7.27	-77	303	1.7	0.40	2,430	1,930	20,700	< 100	37.1	34.1	< 10.0	< 10.0	520	75.7	< 12.0
MW-11	07/31/2018	Baseline	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	--	6.87	1.080	7.44	21.29	147	9.5	13.5	13.5	122	< 5.0	1,980	< 70.0	56.2	< 10.0	< 10.0	< 10.0	286	< 10.0	< 2.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	7.16	0.970	4.55	25.46	106	0.0	11.7	< 1.0	79.4	< 10.0	994	< 100	73.3	< 10.0	< 10.0	< 10.0	313	< 10.0	< 3.0
MW-15D	07/30/2018	Baseline	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	--	6.92	0.820	0.05	17.73	142	>1,000	2.0	< 0.10	148	51.7	3,310	< 70.0	20.2	< 10.0	< 10.0	< 10.0	390	< 10.0	< 6.0
	08/29/2018	30 Days	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	0.00%	7.22	0.762	0.00	18.89	117	57.6	1.0	0.99	18.5	< 10.0	631	< 100	25.6	10.1	< 10.0	12.6	333	< 10.0	< 2.0
MW-15	07/30/2018	Baseline	165	< 5.0	< 5.0	< 5.0	< 2.0	182	--	7.01	0.765	5.97	20.06	11	272	7.6	< 0.20	90.6	21.9	1,200	< 70.0	18.2	< 10.0	< 10.0	< 10.0	288	< 10.0	< 2.0
	08/30/2018	30 Days	128	< 5.0	< 5.0	< 5.0	< 2.0	145	20.33%	7.29	0.778	4.42	22.88	159	18.2	9.4	9.4	166	< 10.0	4,180	< 100	18.8	< 10.0	< 10.0	< 10.0	308	< 10.0	< 2.0
MW-16	07/31/2018	Baseline	18.8	< 5.0	< 5.0	< 5.0	< 2.0	35.8	--	7.00	0.879	6.24	19.19	124	220	2.7	2.7	39.0	< 5.0	603	< 70.0	12.3	< 10.0	< 10.0	< 10.0	322	< 10.0	< 2.0
	08/29/2018	30 Days	20.3	< 5.0	< 5.0	< 5.0	< 2.0	37.3	-4.19%	6.73	0.781	4.36	18.97	155	36.4	2.4	< 0.10	136	< 10.0	1,120	< 100	13.9	< 10.0	< 10.0	< 10.0	378	< 10.0	< 12.0
MW-17	07/30/2018	Baseline	16.7	< 5.0	< 5.0	< 5.0	< 2.0	33.7	--	6.90	0.885	7.56	19.89	196	164	2.8	< 0.10	489	< 5.0	11,900	< 70.0	23.0	< 10.0	< 10.0	< 10.0	408	< 10.0	< 6.0
	08/28/2018	30 Days	26.3	< 5.0	< 5.0	< 5.0	< 2.0	43.3	-28.49%	7.20	0.763	5.31	21.55	112	5.1	6.9	< 0.50	35.2	< 10.0	351	< 100	25.8	< 10.0	< 10.0	< 10.0	312	< 10.0	< 12.0
MW-19	07/30/2018	Baseline	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	22.0	--	6.93	1.050	4.48	19.38	155	>1,000	3.4	< 0.10	910	< 5.0	10,900	< 70.0	19.7	< 10.0	< 10.0	< 10.0	383	< 10.0	< 2.0
	08/29/2018	30 Days	67.8	< 5.0	< 5.0	< 5.0	< 2.0	84.8	-285.45%	7.24	0.846	6.33	21.72	149	11.4	7.3	< 0.20	195	< 10.0	791	< 100	52.1	< 10.0	< 10.0	< 10.0	343	< 10.0	< 12.0
MW-24	07/30/2018	Baseline	79.8	< 5.0	< 5.0	< 5.0	< 2.0	96.8	--	6.95	0.941	5.85	18.50	139	17.0	6.7	< 0.20	170	< 5.0	1,750	< 70.0	95.4	< 10.0	< 10.0	< 10.0	356	< 10.0	< 2.0
	08/30/2018	30 Days	108	< 5.0	< 5.0	< 5.0	< 2.0	125	-29.13%	6.79	0.940	6.77	21.52	177	119	9.5	9.5	1,120	< 10.0	21,200	< 100	27.9	< 10.0	< 10.0	< 10.0	360	76.7	< 2.0
MW-26	07/31/2018	Baseline	124	< 5.0	< 5.0	< 5.0	< 2.0	141	--	6.89	0.835	3.65	20.37	21	143	5.9	5.9	88.1	57.5	625	< 70.0	13.3	< 10.0	< 10.0	< 10.0	273	< 10.0	< 2.0
	08/29/2018	30 Days	154	< 5.0	< 5.0	< 5.0	< 2.0	171	-21.28%	7.03	0.861	2.25	21.61	135	48.2	9.2	< 1.0	423	354	45,000	< 100	15.8	< 10.0	< 10.0	< 10.0	312	46.8	< 20.0

Notes:
Pilot injections completed July 30 through August 3, 2018.
Percent reduction calculated based on total mass of the COCs.
< = Analyte not detected at the specified detection level

FIGURES

ISCR PILOT STUDY DETAIL MAP

O'NEALS CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX PROJECT # 341.14	PROJECT MANAGER J. KINMAN	FILE NO. 341140010
SCALE 1" = 80'	DATE 9/20/18	FIGURE NO. 1

WILCOX ENVIRONMENTAL ENGINEERING

WILCOX PROJECT #
341.14

PROJECT MANAGER
J. KINMAN

FILE NO.
34114006

SCALE
1" = 80'

DATE
09/12/18

FIGURE NO.
2

POTENTIOMETRIC SURFACE (08/27/18)

PILOT TEST REPORT
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX™
ENVIRONMENTAL ENGINEERING

TETRACHLOROETHENE ISOCONCENTRATION - SHALLOW WELL LOCATIONS

PILOT TEST REPORT
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

SCALE 1" = 80'	DATE 09/12/18	FIGURE NO. 3
WILCOX PROJECT # 341.14	PROJECT MANAGER J. KINMAN	FILE NO. 34114008

WILCOX ENVIRONMENTAL ENGINEERING


ISCR PILOT STUDY DISSOLVED PCE REDUCTION AND GEOCHEMICAL DATA MAP
O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN
WILCOX PROJECT #
341.14
PROJECT MANAGER
J. KINMAN
FILE NO.
341140011
SCALE
1" = 80'
DATE
10/11/18
FIGURE NO.
4
WILCOX
ENVIRONMENTAL ENGINEERING
MW-10
[<5.0]
B-11
MW-9
[<5.0]
B-45/MW-90
[10.6]
B-17
GARAGE
GRASS
SHED
RESIDENTIAL
740 E. WASHINGTON ST.
RESIDENTIAL
760 E. WASHINGTON ST.
ALLEY
SIDEWALK
INJECTION POINT (HRC)
INJECTION POINT (PS/CaCl)
INJECTION POINT (PS)
INJECTION POINT (CaCl)
E. MORGAN ST.
E. WASHINGTON ST.
JACKSON ST.

APPENDICES

Appendix A Regenesis Pilot Test Summary Report
Appendix B Groundwater Monitoring Forms
Appendix C Laboratory Analytical Reports and Chain-of-Custody Forms

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August 7, 2018

REGENESIS Proposal No. OwM60435

Jeremy Kinman
Wilcox Environmental Engineering
1552 Main St, Suite 100
Speedway, IN 46224

SUBJECT: Application Summary Report for Remedial Services at the O'Neal's Clothes Depot Cleaners Site

Jeremy,

REGENESIS Remediation Services (RRS) has recently completed an *in-situ* application of PlumeStop® Liquid Activated Carbon™ (PlumeStop), Bio-Dechlor INOCULUM Plus (BDI Plus), Calcium Chloride (CaCl), and Hydrogen Release Compound (HRC) at the O'Neal's Clothes Depot Cleaners (Site) located at 833 East Morgan Street in Martinsville, Indiana. The goal of the *in-situ* injection was to induce rapid treatment of a dissolved plume containing tetrachloroethene (PCE) near the source area and to halt further migration.

RRS mobilized a support pickup truck, injection trailer, and personnel to the site to begin work over a five-day period from July 30th, 2018 to August 3rd, 2018. RRS staffed this project with experienced project personnel who ensured a safe, successful injection application. RRS handled and mixed all REGENESIS products, oversaw a drilling subcontractor, and injected the reagents at the respective treatment area.

Please review the attached application summary page and injection log for more detail on the application.

RRS appreciates the opportunity to work at this site with Wilcox Environmental Engineering. RRS will be available to interpret the field data as it is collected and answer any questions. If you need additional information regarding the application process or attached field notes, please contact Everett Leslie at 574.274.7694 or Andy Kavanagh at 574.304.4353.

Sincerely,

Everett Leslie
Project Supervisor
REGENESIS Remediation Services

Andy Kavanagh
Central Region Project Supervisor
REGENESIS Remediation Services

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Application Summary Page

OVERVIEW

Client: Wilcox Environmental Engineering
Client PM: Nathan Muller
RRS Project Manager: Steve Barnes
RRS Project Supervisor: Everett Leslie

Project Name*:* O'Neal's Clothes Depot Cleaners
Site Address: 833 East Morgan Street, Martinsville, IN 46151
Project Dates: 07/30/2018 – 08/03/2018

TREATMENT TECHNOLOGY

Regenesis Remediation Services (RRS) used PlumeStop, BDI Plus, CaCl, and HRC at the O'Neal's Clothes Depot Cleaners site for the first remediation event. PlumeStop is composed of very fine particles of activated carbon (1-2µm) suspended in water. Once in the subsurface, the material behaves as a colloidal biomatrix binding to the aquifer matrix, rapidly removing contaminants from groundwater and expediting permanent contaminant biodegradation. BDI Plus is an enriched, natural microbial consortium containing species of *Dehalococcoides sp.* (DHC) which are capable of completely dechlorinating contaminants during *in situ* anaerobic bioremediationprocesses. CaCl is used as a parking solution for PlumeStop barriers when groundwater movement is above average. Upon contact with PlumeStop this material binds several particles of the activated carbon together (10-20 µm), arresting their movement through the subsurface, ensuring barrier placement and efficacy. HRC is an engineered, hydrogen release compound designed specifically for enhanced, *in situ* anaerobic bioremediation of chlorinated compounds in groundwater or highly saturated soils. Upon contact with groundwater, this viscous, poly-lactate ester material becomes hydrated and subject to microbial breakdown producing a controlled-release of hydrogen for periods of up to 18-24 months on a single application.

RRS employed remediation design specifications as outlined in designs dated July 24th, 2018.

APPLICATION

Initially, RRS applied HRC in 18 points in 2 rows along flanking the MW-9 alley, with 3 points located in 1 row in the MW-10 alley. Injection points were drilled to 16 feet below ground surface (bgs) using expendable tips, then pulled up to 9 feet bgs while HRC was being pumped into the subsurface to evenly distribute the prescribed HRC over the entire interval.

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RRS applied the REGENESIS product PlumeStop and Calcium Chloride by mixing the products in the RRS injection trailer and injecting through direct push borings drilled with leading 1.5" retractable stainless-steel injection screens (3-foot length). Eight injection points were drilled in a north to south line along the west edge of the alley. The ninth point was located to the east of MW-10, 5 feet east of IP-18, and 5 feet west of IP-17. Each of these points received the designed volume of the PlumeStop and CaCl mixture. BDI Plus was co-applied via slip-stream technology into the points while injecting the solution.

A total of eight injection points were drilled in a north to south line along the east edge of the alley. The ninth and tenth points were located 10 feet and 20 feet to the east of MW-10, respectively. Surfacing was observed at IP-10, IP-12, IP-13, and IP-16 during this phase of the application, however, IP-10, IP-12, and IP-13 did receive the designed volume. When surfacing was encountered, mitigation techniques were applied and are detailed in the injection log. IP-13 was abandoned at 196.94 gallons with the remaining design volume added to IP-19. IP-16 was abandoned at 194.9 gallons, with the remaining design volume added to IP-15 and IP-17. Additionally, IP-15 was moved up gradient of MW-10 and IP-19 was added up gradient of MW-10 to observe influence in MW-10. IP-19 was located 1-foot east of MW-10 and IP-15 was relocated 4 feet to the east of MW-10. Finally, IP-11 was moved to be 5 feet to the north of IP-10, instead of 10 feet to the north, to observe influence in MW-9. BDI Plus was co-applied via slip-stream technology into the points while injecting the PlumeStop solution. Injection pressures were observed between 0 and 68 pounds per square inch (PSI), while flow rates were maintained between 1.0 and 4.6 gallons per minute (GPM).

Subsequent to the PlumeStop injections, a water and CaCl solution was applied at the same locations and intervals in row along the west edge of the alley, per the approved technical design. Surfacing was observed at IP-18 during this phase of the application, however, IP-18 did receive the designed volume. During this portion of the application, injection pressures were observed between 0 and 14 pounds per square inch (PSI), while flow rates were maintained between 1.6 and 4.3 gallons per minute (GPM).

All borings were backfilled with bentonite chips. Injections were completed by pumping on up to four injection points at a time using the RRS injection trailer manifold system. Although pressures were observed under 100 PSI, the RRS trailer is equipped with a pressure bypass valve that will re-route fluids back into the trailer tanks if downhole pressures reach 100 PSI to keep pressures at safe levels for field personnel.

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TREATMENT AREA

A total of 400 pounds of HRC was applied undiluted. A total of 6,095 gallons of PlumeStop was mixed and applied as a 14,800 mg/L solution, with a total of 4,000 pounds applied in the area.

Technology	Total
PlumeStop	4,000 lbs.
HRC	400 lbs.
BDI	18 Liters
CaCl	2,000 lbs.

Application Method: Bottom Up Direct Push Drilling with retractable injection screens and expendable tips

Injection Depth: 16 to 9 feet below ground surface

Number of Injection Points: 19

Deviations from Proposal: IP-13 and IP-16 abandoned before reaching full volume. Remaining volume distributed in IP-15, IP-17, and IP-19. IP-15 moved to influence MW-10 and IP-11 moved to influence MW-9. *For greater detail, see above summary, "Treatment Area" tables, Injection Log, and Injection Map.*

Distribution Monitoring: Visual confirmation of PlumeStop solution observed in MW-9 after 67 gal injected into IP-11 and 216 gal injected into IP-10. Visual confirmation of PlumeStop solution observed in MW-10 after full volume injected.

Technology	Quantity Per Point
PlumeStop/CaCl	IP-1 through IP-9: 333.0 gallons IP-10 through IP19: 0.0 gallons
PlumeStop	IP-1 through IP-9: 0.0 gallons IP-10, IP-11, IP-12, IP-14, IP-18: 333.0 gallons IP-13: 196.94 gallons IP-15: 402.05 gallons IP-16: 194.90 gallons IP-17: 402.05 gallons IP-19: 136.06 gallons
CaCl	IP-1 through IP-9: 0.0 gallons IP-10 through IP-18: 222.0 gallons
HRC	22.2 lbs.
BDI	1.0 L

Please see attached Appendix A - Injection Log for more details on injection flow rates and pressures observed.

Wilcox Environmental Engineering - O'Neal's Clothes Depot Cleaners

Plumestop Injection Summary Log

Dissolved Plume Barrier

Pilot Test

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Injected: Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Interval	Total Gallons Per Location	Batches Injected Per Location	Pounds of PlumeStop Injected Per Location	Pounds of CaCl Injected Per Location	Liters of BDI Per Interval	Pounds of HRC Injected Per Interval	Comments	Injection Tooling	Refusal	Surfacing
1	8/1/2018	9:25	16-13	68	3.44	0.00	143.26	143.26	333.00	1.00	222.2	111.1	0.43	9.52	PS/CaCl Sol'n + BDI + HRC. Point was redriven <1 ft. SE of point due to high pressures with a low flowrate.	3-Foot Screen	No	No
		10:45	13-10	8	3.53	143.26	187.68	44.42					0.43	9.52	Surfacing observed after 209 gal injected out of original borehole. Letting settle for 10 minutes and continuing again at a flowrate of 2.0 gpm. Surfacing observed out of annulus of MW-9D at 235 gal. Letting settle for ten minutes and continuing at a lower flowrate. After packing the sand down, surfacing out of the annulus of MW-9D ceased. Surfacing observed out of MW-9 after 280 gal. injected.			Yes
		12:04	10-9	15	2.28	187.68	333.00	145.32					0.14	3.17	Surfacing observed out of the asphalt along the driveway on the east side 9 ft. east of point at 325 gal.			Yes
2	7/31/2018	13:48	16-13	12	2.82	0.00	145.79	145.79	380.57	1.14	254.0	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		14:30	13-10	2	3.50	145.79	187.52	41.73					0.43	9.52	Surfacing observed around rod at 183 gal. Letting settle for 10 minutes and continuing injection at 2.5 gpm. Surfacing continued after reducing flowrate to 2.0 gpm after 187 gal injected. Raised point to the next interval and injecting the remaining volume. Surfacing observed after 187 gal injected. Redriving point <1 ft. east and continuing with the remaining volume			Yes
		15:41		32	2.87	187.52	286.43	98.91							Offset <1 ft. east			No
		16:17	10-9	18	3.50	286.43	380.57	94.14					0.14	3.17				
3	7/31/2018	13:45	16-13	20	2.72	0.00	145.67	145.67	434.24	1.30	289.8	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		14:30	13-10	10	3.50	145.67	288.92	143.25					0.43	9.52				
		16:06	10-9	16	3.00	187.68	333.00	145.32					0.29	3.17				
4	7/31/2018	13:23	16-13	6	3.02	0.00	143.11	143.11	285.43	0.86	190.5	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		14:30	13-10	2	3.50	143.11	265.32	122.21					0.43	9.52	Surfacing observed 9.5 ft. east of point out of gravel west alongside garage at 213 gal. Letting settle for 10 minutes and continuing injection at 2.5 gpm.			Yes
		16:18	10-9	2	1.00	265.32	285.43	20.11					0.00	3.17	Surfacing observed after 271 gal injected. Injecting 285 gal and abandoning point. Remaining volume of PS/CaCl solution and BDI volume added to IP-3			Yes
5	8/1/2018	9:23	16-13	15	3.64	0.00	147.77	147.77	333.00	1.00	222.2	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		10:15	13-10		3.09	147.77	290.23	142.46					0.43	9.52				
		11:40	10-9		2.80	290.23	333.00	42.77					0.14	3.17	Surfacing observed around rod at 295 gal around rod. Let settle and continued injection. Surfacing observed 8 ft. SE of point out of gravel west alongside garage at 325 gal. Lowering flowrate to 1.7 gpm to complete injection.			Yes
6	7/31/2018	10:56	16-13	18	2.98	0.00	144.32	144.32	333.00	1.00	222.2	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		12:00	13-10	10	3.50	144.32	288.87	144.55					0.43	9.52				
		12:47	10-9	2	3.00	288.87	333.00	44.13					0.14	3.17	Finished injection at 13:00			
7	8/1/2018	9:19	16-13	15	3.62	0.00	150.30	150.30	333.00	1.00	222.2	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		10:15	13-10	0	3.14	150.30	293.21	142.91					0.43	9.52				
		11:16	10-9		3.50	293.21	333.00	39.79					0.14	3.17				
8	7/31/2018	10:23	16-13	4	3.16	0.00	142.75	142.75	333.00	1.00	222.2	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		11:27	13-10		3.09	142.75	285.86	143.11					0.43	9.52				
		12:47	10-9	2	3.42	285.86	333.00	47.14					0.14	3.17	Finished injection at 13:00			
9	7/31/2018	10:38	16-13	4	3.30	0.00	143.11	143.11	333.00	1.00	222.2	111.11	0.43	9.52	PS/CaCl Sol'n + BDI + HRC	3-Foot Screen	No	No
		11:46	13-10	2	3.00	143.11	286.10	142.99					0.43	9.52				
		12:47	10-9		2.94	286.10	333.00	46.90					0.14	3.17	Finished injection at 13:00			

PLUME STOP Liquid Activated Carbon

Wilcox Environmental Engineering - O'Neal's Clothes Depot Cleaners

Plumestop Injection Summary Log

Dissolved Plume Barrier

Pilot Test

REGENESIS REMEDIATION SERVICES Technology-Based Solutions for the Environment

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Injected			Total Gallons Per Location	Batches Injected Per Location	Pounds of PlumeStop Injected Per Location	Pounds of CaCl Injected Per Location	Liters of BDI Per Interval	Pounds of HRC Injected Per Interval	Comments	Injection Tooling	Refusal	Surfacing
						Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Interval										
10	8/2/2018	9:15	16-13	4	3.07	0.00	146.33	146.33	333.00	1.00	222.2	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		10:22	13-10	7	1.30	146.33	287.20	140.87					0.43	9.52				
		11:51	10-9	26	1.50	287.20	333.00	45.80					0.14	3.17				
11	8/2/2018	10:39	16-13	22	2.36	0.00	146.66	146.66	333.00	1.00	222.2	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		11:50	13-10	15	2.80	146.66	290.33	143.67					0.43	9.52				
		12:34	10-9	16	3.01	290.33	333.00	42.67					0.14	3.17				
12	8/1/2018	14:35	16-13	12	2.82	0.00	151.30	151.30	333.00	1.00	222.2	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		15:35	13-10	10	3.80	151.30	286.34	135.04					0.43	9.52				
		16:15	10-9	12	3.66	286.34	333.00	46.66					0.14	3.17				
13	8/2/2018	11:40	16-13	0	3.25	0.00	172.31	172.31	196.94	0.59	131.4	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		12:28	13-10	5	3.30	172.31	196.94	24.63					0.43	9.52	Surfacing observed east of point out of gravel alongside garage on east side after 195 gal injected. After letting settle for 10 minutes, surfacing continued. Point abandoned. Remaining volume of BDI will go into IP-19			Yes
	7/30/2018	13:27	10-9	---	---	---	---	---					0.00	3.17				No
14	8/1/2018	12:26	16-13	5	3.16	0.00	148.33	148.33	333.00	1.00	222.2	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		13:21	13-10	40	3.32	148.33	285.57	137.24					0.43	9.52				
		14:19	10-9	11	2.54	285.57	333.00	47.43					0.14	3.17				
15	8/2/2018	9:40	16-13	4	3.48	0.00	173.12	173.12	402.05	1.21	268.3	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven. **Design Change:** Adding additional volume into IP-15 and IP-17 due to surfacing issues with IP-16.	3-Foot Screen	No	No
		10:30	13-10	0	3.70	173.12	344.62	171.50					0.43	9.52				
		11:10	10-9	0	3.70	344.62	402.05	57.43					0.14	3.17				
16	8/1/2018	12:28	16-13	24	3.22	0.00	143.29	143.29	194.90	0.59	130.1	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		13:21	13-10	4	2.98	143.29	179.86	36.57					0.43	9.52	Surfacing observed around rod after 155 gal injected. Letting settle for 10 minutes and continuing injection at a lower flowrate. Surfacing continues at 165 gal. Letting settle and continuing injection at 1.5 gpm. Surfacing continued at 179.86. Lifting to the next interval and injecting the remaining volume.			Yes
		14:08	10-9	8	1.76	179.86	194.90	15.04					0.14	3.17	Surfacing continued out of gravel <1 ft. north of point with a flowrate of 1.4 gpm. Point abandoned at 194.9 gal. Remaining volume added to IP-15 and IP-17			Yes
17	8/1/2018	15:24	16-13	10	2.44	0.00	172.88	172.88	402.05	1.21	268.3	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven. **Design Change:** Adding additional volume into IP-15 and IP-17 due to surfacing issues with IP-16.	3-Foot Screen	No	No
	8/2/2018	9:15	13-10	0	3.14	172.88	344.61	171.73					0.43	9.52				
		10:10	10-9	0	3.70	344.61	402.05	57.44					0.14	3.17				
18	8/1/2018	12:31	16-13	0	3.35	0.00	142.76	142.76	333.00	1.00	222.2	111.11	0.43	9.52	PS/H2O Sol'n + BDI + HRC w/ an Offset CaCl/H2O Sol'n Point Driven	3-Foot Screen	No	No
		13:21	13-10	2	3.75	142.76	285.43	142.67					0.43	9.52				
		14:16	10-9	0	3.60	285.43	333.00	47.57					0.14	3.17				
19	8/2/2018	13:25	16-13	10	4.62	0.00	60.21	60.21	136.06	0.41	90.8	0.00	0.00	0.00	PS/H2O Sol'n + BDI	3-Foot Screen	No	No
		14:02	13-10	5	3.29	60.21	116.62	56.41					0.00	0.00				
		14:22	10-9	0	2.58	116.62	136.06	19.44					0.14	0.00				

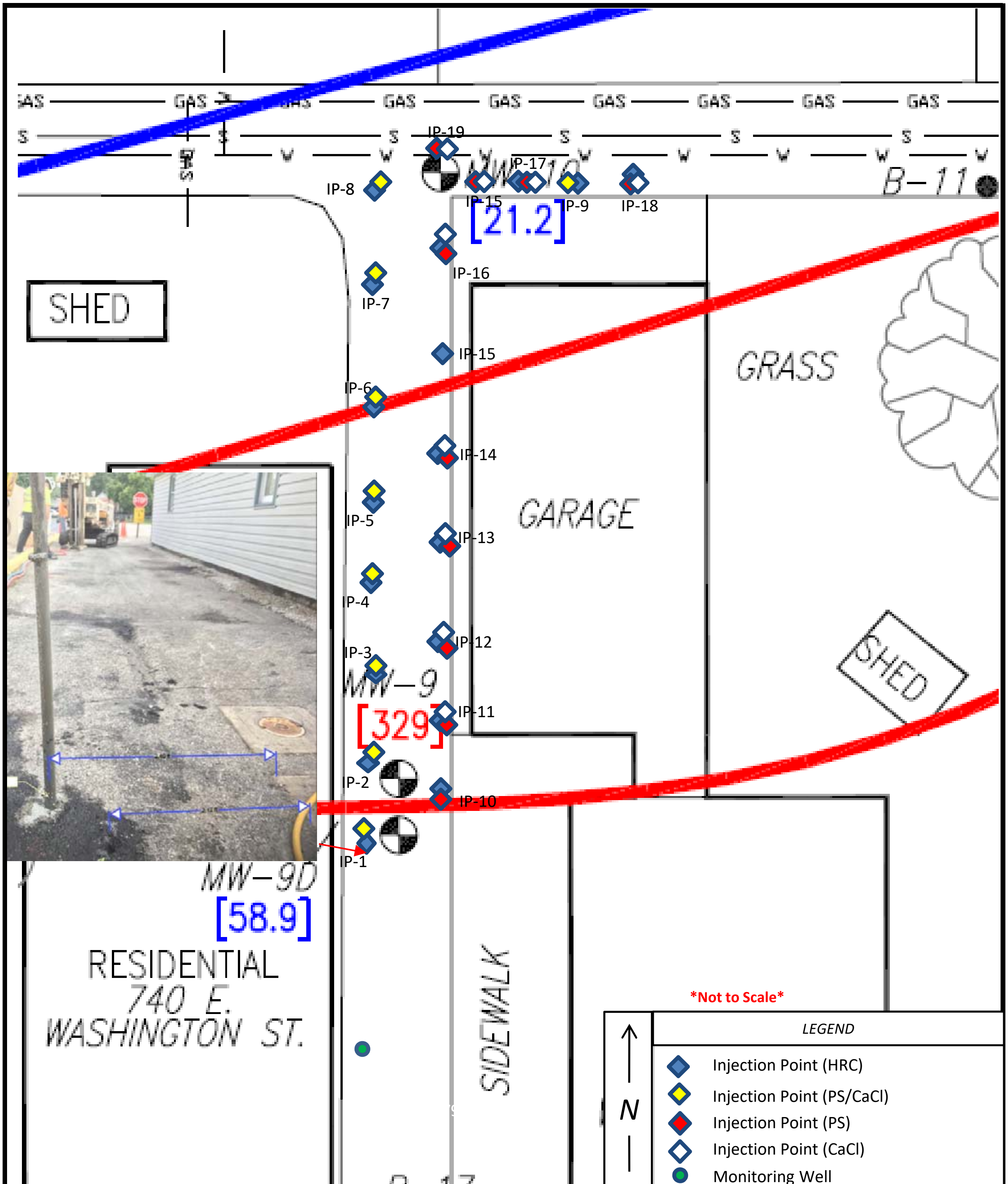
Total Project Volume PlumeStop (gal)	Total Batches Injected	Total Project Pounds PlumeStop	Total Project Pounds CaCl	Total Project Volume BDI (Liter)	Total Project Pounds HRC
6095.24	18	4067.6	2000.0	18.00	400.00

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Wilcox Environmental Engineering - O'Neal's Clothes Depot Cleaners
Calcium Chloride Solution Injection Summary Log
CaCl/H2O Points
Pilot Test

Injection Point	Date	Time	Injection Depth (feet)	Injection Pressure (psi)	Flow Rate (gpm)	Volume of PlumeStop Injected			Total Gallons Per Location	Pounds of CaCl Injected Per Location	Comments	Injection Tooling	Refusal	Surfacing
						Beginning Flow Meter (gal)	Ending Flow Meter (gal)	Gallons Injected Per Interval						
10	8/3/2018	9:24	16-13	5	2.16	0.00	98.64	98.64	227.54	113.77		3-Foot Screen	No	No
		9:52	13-10	14	3.20	98.64	190.48	91.84						
		10:18	10-9	10	3.14	190.48	227.54	37.07						
11	8/3/2018	9:24	16-13	12	2.04	0.00	96.34	96.34	216.90	108.45		3-Foot Screen	No	No
		10:28	13-10	6	2.34	96.34	190.48	94.14						
		10:44	10-9	8	3.60	190.48	216.90	26.43						
12	8/3/2018	9:24	16-13	0	2.16	0.00	95.24	95.24	230.65	115.33		3-Foot Screen	No	No
		10:24	13-10		3.98	95.24	194.27	99.03						
		10:44	10-9	2	3.76	194.27	230.65	36.38						
13	8/3/2018	10:55	16-13	14	2.76	0.00	95.24	95.24	219.11	109.56		3-Foot Screen	No	No
		11:25	13-10		4.30	95.24	190.48	95.24						
		12:02	10-9	10	3.26	190.48	219.11	28.64						
14	8/2/2018	13:35	16-13	4	2.86	0.00	95.24	95.24	216.90	108.45		3-Foot Screen	No	No
		16:29	13-10		1.57	95.24	191.46	96.22						
		17:12	10-9	6	4.68	191.46	216.90	25.44						
15	8/3/2018	11:01	16-13	0	2.53	0.00	95.24	95.24	220.48	110.24		3-Foot Screen	No	No
		11:23	13-10		4.07	95.24	190.48	95.24						
		11:47	10-9	0	4.18	190.48	220.48	30.01						
16	8/3/2018	9:25	16-13	12	2.66	0.00	96.37	96.37	223.60	111.80		3-Foot Screen	No	No
		9:52	13-10	14	3.11	96.37	193.27	96.90						
		10:18	10-9	10	2.99	193.27	223.60	30.33						
17	8/2/2018	15:28	16-13	4	3.06	0.00	95.24	95.24	220.84	110.42		3-Foot Screen	No	No
		15:47	13-10	0	3.25	95.24	190.48	95.24						
		16:53	10-9		3.01	190.48	220.84	30.37						
18	8/2/2018	15:28	16-13	2	2.32	0.00	95.24	95.24	223.96	111.98	Surfacing observed after 27 gal injected. Lowered flowrate to 2.3 gpm and continued injection.	3-Foot Screen	No	Yes
		16:08	13-10	0	1.59	95.24	190.48	95.24						No
		17:10	10-9		2.15	190.48	223.96	33.49						

Total Project Volume CaCl/H2O Solution (gal)	Total Project Pounds CaCl
2000.00	1000.00



Prepared By:
DW

Date Prepared:
August 2018

Figure 1 – Injection Locations Map
O'Neals Clothes Depot Cleaners
833 E Morgan Street
Martinsville, Indiana

PLUME STOP Liquid Activated Carbon
HRC HYDROGEN RELEASE COMPOUND
BDI PLUS BIO-DECHLOR INOCULUM
REGENESIS REMEDIATION SERVICES
Technology-Based Solutions for the Environment

Appendix 5 - PHOTO LOG
Wilcox Environmental Engineering – O'Neal's Clothes Depot Cleaners

Photo 1: View looking north. BDI cooler, HRC buckets, GeoProbe GP300 Grout Pump, Drill rig, Midway and RRS personnel in view. (*July 30, 2018*)

Photo 2: View looking south. Drill rig, Trailer, and RRS personnel in view. (*July 30, 2018*)

Photo 3: View looking north. MW-9 and MW-9 D with point locations marked. (*July 27, 2018*)

Photo 4: View looking southeast. RRS personnel in view injecting HRC with a Yamada pump. (*July 30, 2018*)

Photo 5: View looking north. GeoProbe drill rig in view while injecting on IP-19. Bailer showing no influence on MW-10 prior to injection. (*August 2, 2018*)

Photo 6: View looking north. Post-injection picture of bailer at MW-10 showing jet black color, indicating strong influence. (*August 2, 2018*)

Photo 7: View looking northwest. Post-injection picture of bailer at MW-9D showing jet black color, indicating strong influence. (*August 2, 2018*)

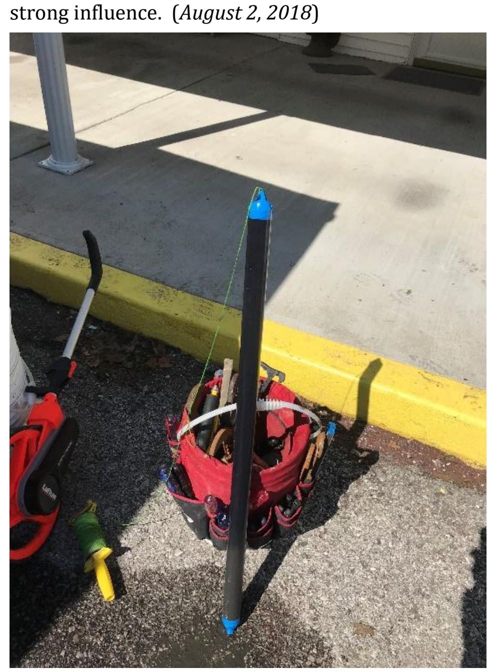


Photo 8: View looking southwest. Post-injection picture of bailer at MW-9 showing jet black color, indicating strong influence. (*August 2, 2018*)

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID	MW- 08	**Project #**	341.14
Sample ID	MW- 08 _WG_180731	**Project ID**	O'Neals Cleaners
Sample Collector(s)	DP	**PM**	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.54	feet	**Screened Interval:** 6-16'	**1 Well Volume: N/A**
Water Level	10.20	feet	**Pump Depth in Well:** 11'	**3 Well Volumes: N/A**
Water Column	5.34	feet		**Well Diameter: 2"**

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): —

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
100	10.24	5		7.11	1.33	6.15	17.49	55	325
↓	↓	10		7.01	1.37	5.32	19.33	155	212
		15		7.03	1.31	5.15	19.21	154	173
		20		7.00	1.25	5.01	19.17	154	98.7
		25		6.99	1.23	4.83	19.17	154	33.8
		30		6.99	1.22	4.75	19.16	154	12.7

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance	Color:	Clear	Brown	Gray	Other:	**Sample Date**	~~07/30/2018~~ 7-31-18
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	**Sample Time**	1040
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID MW- 09	Project # 341.14
Sample ID MW- 09 _WG_180730	Project ID O'Neals Cleaners
Sample Collector(s)	PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.81	feet	Screened Interval:	1 Well Volume: N/A
Water Level	11.00	feet	Pump Depth in Well:	3 Well Volumes: N/A
Water Column	4.81	feet	13'	Well Diameter: 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 0.79

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): **1"** = 0.041 **2"** = 0.163 **4"** = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
150	11.05	5		7.01	.919	7.40	17.21	128	7100
150	11.05	10		7.05	.915	6.99	17.18	131	800
150	11.05	15		7.05	.935	6.20	17.14	132	800
150	11.05	20		7.06	.927	6.21	17.11	132	650

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
Color:	Clear	Brown	Gray	Other:	Sample Date	07/30/2018
Turbidity:	Clear	Slightly	Very	Other:		
Odor:	None	Mild	Strong	Other:	Sample Time	0945
Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 09D	Project # 341.14
Sample ID MW- 09D _WG_180730	Project ID O'Neals Cleaners
Sample Collector(s)	PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	37.48	feet	Screened Interval:	1 Well Volume: N/A
Water Level	11.17	feet	Pump Depth in Well:	3 Well Volumes: N/A
Water Column	26.31	feet	35.5'	Well Diameter: 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 0.79

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
100	11.36	5		7.15	1.16	4.61	15.83	143	>1000
100	11.38	10		7.11	.909	1.74	15.78	140	279
100	11.38	15		7.06	.880	1.44	15.77	141	146
100	11.38	20		7.00	.843	1.07	15.74	136	40.0
100	11.38	25		6.99	.817	0.83	15.71	133	21.9
100	11.38	30		6.97	.808	0.71	15.72	130	16.5

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 0910
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 10 | Project # 341.14
Sample ID MW-10 _WG_180730 | Project ID O'Neals Cleaners
Sample Collector(s) | PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.59 feet	Screened Interval:		1 Well Volume: N/A
Water Level	11.25 feet	Pump Depth in Well:	13.5'	3 Well Volumes: N/A
Water Column	4.34 feet			Well Diameter: 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability
Total Volume Purged (gallons): 1.59
Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine
WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	11.27	5		7.21	1.24	8.11	18.74	112	578
200	11.28	10		7.08	1.24	7.91	18.72	119	205
200	11.28	15		7.01	1.24	7.75	18.83	123	35.0
200	11.28	20		6.99	1.22	7.68	18.85	121	9.2
200	11.28	25		6.99	1.22	7.65	18.85	119	7.5
200	11.28	30		6.98	1.22	7.49	18.84	119	9.2

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: +/- 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 0810
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	CG	40 mL	HCl
Sulfate	See Below			
Nitrate				
BOD/COD	↓ ↓			
Alkalinity				
Methane, Ethane, Ethene	3	CG	40 ml	HCl
AL Total ~~and Dissolved Iron~~ Metals	1	Plastic	250 ml	Nitric
~~Total and~~ Dissolved ~~Manganese~~ Metals	1	Plastic	250 ml	Unpreserved

REMARKS/COMMENTS

Sulfate | Nitrate | Alkalinity - 1 500 ml bottle unpreserved
COD - 1 250 ml Sulfuric BOD - 1 500 ml bottle unpreserved

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 11	**Project #** 341.14
Sample ID MW- 11 _WG_180731	**Project ID** O'Neals Cleaners
Sample Collector(s) OP	**PM** J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.80	feet	**Screened Interval:** 6-16'	**1 Well Volume:** N/A
Water Level	11.37	feet	**Pump Depth in Well:** 13.5'	**3 Well Volumes:** N/A
Water Column	4.43	feet		**Well Diameter:** 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons):

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
100		5		7.04	1.13	8.02	21.53	175	>1000
		10		7.00	1.10	7.76	21.43	155	>1000
		15		6.93	1.09	7.42	21.32	153	742
		20		6.90	1.09	7.57	21.29	151	247
		25		6.88	1.08	7.42	21.29	146	55.6
		30		6.87	1.08	7.44	21.29	147	9.5

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance	Color:	Clear	Brown	Gray	Other:	**Sample Date** ~~07/30/2018~~ 7-31-18
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	**Sample Time** 14:30
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

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Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 15	Project # 341.14
Sample ID MW- 15 _WG_180730	Project ID O'Neals Cleaners
Sample Collector(s)	PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	16.70	feet	Screened Interval:	1 Well Volume: N/A
Water Level	9.80	feet	Pump Depth in Well:	3 Well Volumes: N/A
Water Column	6.90	feet	14.5'	Well Diameter: 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 1.19

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
150	9.84	5		7.04	.761	6.75	18.55	115	>1000
150	9.84	10		7.04	.757	6.18	19.86	111	637
150	9.84	15		7.03	.759	6.11	20.11	112	497
150	9.84	20		7.02	.760	6.05	20.19	108	346
150	9.84	25		7.01	.764	6.02	20.11	108	253
150	9.84	30		7.01	.765	5.97	20.06	111	272

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 1200
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

WILCOX ENVIRONMENTAL ENGINEERING

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID MW- 15D

Sample ID MW- 15D _WG_1807~~30~~30

Sample Collector(s)

Project # 341.14

Project ID O'Neals Cleaners

PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	34.75 feet	Screened Interval:		1 Well Volume: N/A
Water Level	9.95 feet	Pump Depth in Well:	32.5'	3 Well Volumes: N/A
Water Column	24.80 feet			Well Diameter: 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 0.99

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
150	9.97	5		7.15	0.806	.00	17.52	162	>1000
150	9.97	10		7.00	.803	.32	17.27	156	>1000
150	9.97	15		6.96	.805	.19	17.24	152	>1000
150	9.97	20		6.94	.802	.09	17.24	143	>1000
150	9.97	25		6.92	.820	.05	17.73	142	>1000

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 1110
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX
ENVIRONMENTAL ENGINEERING

Well ID MW- 16	**Project #** 341.14
Sample ID MW- 16 _WG_180~~7~~31	**Project ID** O'Neals Cleaners
Sample Collector(s) OP	**PM** J. Kinman

WATER LEVEL MEASUREMENT

Well Depth 15.65 feet	**Screened Interval:** 6-16'	**1 Well Volume:** N/A
Water Level 11.29 feet	**Pump Depth in Well:** 11'	**3 Well Volumes:** N/A
Water Column 4.36 feet		**Well Diameter:** 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons):

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
100	11.34	5min		7.06	0.876	5.62	18.23	106	>1000
		10		7.03	0.877	5.64	18.55	111	912.4
		15		7.01	0.878	5.97	18.73	117	731
		20		6.99	0.879	6.11	19.07	121	473
		25		7.00	0.879	6.21	19.11	124	271
		30		7.00	0.879	6.24	19.19	124	220

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance	Color:	Clear	Brown	Gray	Other:	**Sample Date**	~~07/30/2018~~ 7-31-18
	Turbidity:	Cloudy	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	**Sample Time**	9:30
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

WILCOX
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Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID MW- 17	Project # 341.14
Sample ID MW- 17 _WG_180730	Project ID O'Neals Cleaners
Sample Collector(s)	PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.85	feet	Screened Interval:	1 Well Volume: N/A
Water Level	11.30	feet	Pump Depth in Well:	3 Well Volumes: N/A
Water Column	4.55	feet	13.5'	Well Diameter: 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 0.79

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
150	11.33	5		7.11	.862	8.53	19.40	222	>1000
150	11.33	10		6.96	.857	8.24	19.55	214	>1000
150	11.33	15		6.93	.858	8.07	19.66	210	>1000
150	11.33	20		6.90	.875	7.83	19.81	205	771
150	11.33	25		6.90	.887	7.66	19.89	200	312
150	11.33	30		6.90	.885	7.56	19.89	196	164

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 1445
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

WILCOX ENVIRONMENTAL ENGINEERING

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID MW- 19	**Project #** 341.14
Sample ID MW- 19 _WG_180730	**Project ID** O'Neals Cleaners
Sample Collector(s)	**PM** J. Kinman

WATER LEVEL MEASUREMENT

Well Depth 19.75 feet	**Screened Interval:**		**1 Well Volume:** N/A
Water Level 12.70 feet	**Pump Depth in Well:** 17.5'		**3 Well Volumes:** N/A
Water Column 7.05 feet			**Well Diameter:** 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 0.59

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): **1"** = 0.041 **2"** = 0.163 **4"** = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
150	12.70	5		7.01	1.03	4.73	18.45	159	>1000
150	12.71	10		6.95	1.05	4.56	19.00	157	>1000
150	12.71	15		6.93	1.05	4.48	19.38	155	>1000

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	**Sample Date** 07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	**Sample Time** 1330
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

WILCOX ENVIRONMENTAL ENGINEERING

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID	MW- 24	**Project #**	341.14
Sample ID	MW- 24 _WG_180730	**Project ID**	O'Neals Cleaners
Sample Collector(s)		**PM**	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	19.84	feet	**Screened Interval:**	**1 Well Volume: N/A**
Water Level	13.67	feet	**Pump Depth in Well:** 17.5'	**3 Well Volumes: N/A**
Water Column	6.17	feet		**Well Diameter: 2"**

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons): 1.19

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
150	13.70	5		7.17	.947	6.87	18.20	149	>1000
150	13.70	10		7.03	.950	6.22	18.39	148	800
150	13.72	15		6.98	.969	6.11	18.49	147	262
150	13.72	20		6.96	.962	6.02	18.46	145	93.0
150	13.72	25		6.95	.943	5.91	18.47	141	32.7
150	13.72	30		6.95	.941	5.85	18.50	139	17.0

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance	Color:	Clear	Brown	Gray	Other:	**Sample Date**	07/30/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	**Sample Time**	1300
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX
ENVIRONMENTAL ENGINEERING

Well ID MW- 26	**Project #** 341.14
Sample ID MW- 26 _WG_180~~7~~31	**Project ID** O'Neals Cleaners
Sample Collector(s) OP	**PM** J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	16.61 feet	**Screened Interval:**	**1 Well Volume:** N/A
Water Level	10.03 feet	**Pump Depth in Well:** 12'	**3 Well Volumes:** N/A
Water Column	6.58 feet		**Well Diameter:** 2"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability

Total Volume Purged (gallons):

Decontamination Procedure: Mirco+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
100		5 min		7.16	0.894	3.59	20.20	-89	>1000
		10		7.07	0.877	3.61	20.27	-31	>1000
		15		7.07	0.842	3.65	20.29	-7.7	643
		20		6.95	0.837	3.67	20.35	10	313
		25		6.89	0.836	3.66	20.37	17	212
		30		6.89	0.835	3.65	20.47	21	183

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance	Color:	Clear	Brown	Gray	Other:	**Sample Date** ~~07/30/2018~~ 7/31/18
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	**Sample Time** 1540
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
8260 VOCs	3	AG	40 mL	HCl
Sulfate				
Nitrate				
BOD/COD				
Alkalinity				
Methane, Ethane, Ethene				
Total and Dissolved Iron				
Total and Dissolved Manganese				

REMARKS/COMMENTS

Added an extension on TOC due to pool of water

WILCOX
ENVIRONMENTAL ENGINEERING

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID	MW-08	**Project #**	341.14-104.03
Sample ID	MW- 08 _WG_180828	**Project ID**	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	**PM**	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.55 feet	**Screened Interval:** NA	**1 Well Volume:**	0.856
Water Level	10.30 feet	**Pump Depth in Well:** 13'	**3 Well Volumes:**	2.567
Water Column	5.25 feet		**Well Diameter:**	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.31

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	10.37	5	0.05	7.18	0.898	4.26	28.14	87	1000
200	10.37	10	0.10	7.39	0.886	4.47	27.88	87	176
200	10.37	15	0.15	7.39	0.878	4.14	28.26	92	167
200	10.37	20	0.21	7.39	0.870	3.86	28.74	96	425
200	10.37	25	0.26	7.39	0.864	3.71	28.64	100	148
200	10.37	30	0.31	7.39	0.870	3.67	28.57	102	137

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** + 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance							
	Color:	Clear	Brown	Gray	Other:	**Sample Date**	8/28/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	**Sample Time**	1520
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 09 | Project # 341.14-104.03
Sample ID MW- 09 _WG_1808 | Project ID O'Neals Clothes Depot
Sample Collector(s) JMP & LD | PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth 15.80 feet	Screened Interval: NA	1 Well Volume: 0.758
Water Level 11.15 feet	Pump Depth in Well: 13'	3 Well Volumes: 2.274
Water Column 4.65 feet		Well Diameter: 2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons):

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	11.18	5	0.05	7.43	1.16	0.00	27.06	-16	1000
200	11.19	10	0.10	7.45	1.15	0.00	27.60	-7	885
200	11.21	15	0.15	7.48	1.09	0.00	27.58	4	411
200	11.22	20	0.21	7.47	1.09	0.00	28.62	10	284
200	11.22	25	0.26	7.47	1.08	0.00	28.64	12	144
200	11.22	30	0.31	7.47	1.08	0.00	28.68	12	108

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 8/27/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 1425
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Water initially removed from the well was black and very turbid

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX
ENVIRONMENTAL ENGINEERING

Well ID	MW- 9D	Project #	341.14-104.03
Sample ID	MW- 9D _WG_1808	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	37.48 feet	Screened Interval: NA	1 Well Volume:	4.267
Water Level	11.30 feet	Pump Depth in Well: 34'	3 Well Volumes:	12.802
Water Column	26.18 feet		Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability/ Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): ~~12.8~~ JMP 0.317

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	11.30	5	0.05	7.00	0.744	5.28	27.26	-17	868
		10	0.10	7.12	0.708	4.07	27.31	-5	680
		15	0.15	7.20	0.708	3.75	27.62	-7	479
		20	0.21	7.21	0.704	3.47	27.57	-10	367
		25	0.26	7.22	0.691	2.99	27.76	-14	261
		30	0.31	7.21	0.696	2.74	27.29	-17	181

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: +/- 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 8/29/2018
	Turbidity:	Clear	Slight	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 1330
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID	MW- 10	Project #	341.14-104.03
Sample ID	MW- 10 _WG_1808	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.60 feet	Screened Interval: NA	1 Well Volume: 0.686
Water Level	11.39 feet	Pump Depth in Well: 13'	3 Well Volumes: 2.058
Water Column	4.21 feet		Well Diameter: 2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow ~~Stability~~ / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons):

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	11.44	5	0.05	7.17	1.67	0.62	23.84	-29	1000
200	11.44	10	0.10	7.15	1.14	0.28	24.84	-30	0.0
200	11.44	15	0.15	7.29	1.09	0.07	24.46	-64	0.0
200	11.44	20	0.21	7.26	1.10	0.05	22.88	-77	603
200	11.44	25	0.26	7.22	1.09	0.02 JMP	22.16	-80	776
200	11.44	30	0.31	7.27	1.11	0.00	7.27	-77	303

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: + 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance							
	Color:	Clear	Brown	Gray	Other:	Sample Date	8/28/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	Sample Time	1415
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Water initially removed from well was black and very turbid

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX
ENVIRONMENTAL ENGINEERING

Well ID	MW- 11	Project #	341.14-104.03, 114
Sample ID	MW- 11 _WG_180828	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	JMP ~~11.90~~ 15.80 feet	Screened Interval:	NA	1 Well Volume:	0.668
Water Level	11.90 feet	Pump Depth in Well:	13'	3 Well Volumes:	2.005
Water Column	4.10 feet			Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.26

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	11.93	5	0.05	6.85	1.07	5.47	24.25	127	210
200	11.93	10	0.10	7.14	0.987	4.58	24.53	106	12.3
200	11.93	15	0.15	7.16	0.973	4.52	25.09	104	5.5
200	11.93	20	0.21	7.12	0.968	4.56	25.33	108	0.0
200	11.93	25	0.26	7.16	0.970	4.55	25.46	106	0.0
JMP ~~200~~	~~11.93~~	~~30~~							

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance							
	Color:	Clear	Brown	Gray	Other:	Sample Date	8/28/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	Sample Time	1120
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6 JMP	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Stabilized at JMP ~~20~~ 25 minutes

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID	MW- 15	Project #	341.14-104.03
Sample ID	MW- 15 _WG_180830	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	16.65 feet	Screened Interval: NA		1 Well Volume: 1.085
Water Level	9.99 feet	Pump Depth in Well: 13.65'		3 Well Volumes: 3.257
Water Column	6.66 feet			Well Diameter: 2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.31

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	10.08	5	0.05	7.19	0.781	4.82	20.24	161	311
200	10.08	10	0.10	7.31	0.779	4.81	22.53	156	175
		15	0.15	7.31	0.779	4.79	22.63	158	127
		20	0.21	7.31	0.781	4.60	22.75	159	76.3
		25	0.26	7.31	0.782	4.48	22.88	159	61.9
		30	0.31	7.29	0.778	4.42	22.88	159	18.2

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: +/- 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance						
Color:	Clear	Brown	Gray	Other:	Sample Date	8/30 /2018
Turbidity:	Clear	Slightly	Very	Other:		
Odor:	None	Mild	Strong	Other:	Sample Time	1145
Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Dup-2 (114), Only Dup. for 104.03, listed as dup-01 on that chain

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID	MW- 15D	Project #	341.14-104.03
Sample ID	MW- 15D _WG_1808 30	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	34.75 feet	Screened Interval: NA	1 Well Volume:	4.015
Water Level	10.12 feet	Pump Depth in Well: 31.75'	3 Well Volumes:	12.044
Water Column	24.63 feet		Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.31

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	10.23	5	0.05	7.37	0.746	3.87	18.48	182	20.1
200	10.23	10	0.10	7.19	0.774	0.00	18.74	171	262
200	10.23	15	0.15	7.22	0.772	0.00	18.65	167	211
200	10.23	20	0.21	7.26	0.771	0.00	18.72	154	151
200	10.23	25	0.26	7.27	0.769	0.00	18.62	145	133
200	10.23	30	0.31	7.22	6.762	0.00	18.89	117	57.6

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: +/- 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance						
Color:	Clear	Brown	Gray	Other:	Sample Date	8/30/2018
Turbidity:	Clear	Slightly	Very	Other:		
Odor:	None	Mild	Strong	Other:	Sample Time	1100
Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	~~1~~ 2	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID	MW- 16	Project #	341.14-104.03, 114
Sample ID	MW- 16 _WG_180829	Project ID	O'Neals Clothes Depot
Sample Collector(s)	MP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	15.00 feet	Screened Interval: NA	1 Well Volume:	0.580
Water Level	11.44 feet	Pump Depth in Well: 13'	3 Well Volumes:	1.741
Water Column	3.56 feet		Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.31

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	11.49	5	0.05	6.68	0.830	5.05	19.48	193	0.0
200	11.49	10	0.10	6.17	0.776	4.52	20.13	177	925
200	11.50	15	0.15	6.36	0.782	4.58	19.29	172	411
200	11.51	20	0.21	6.49	0.781	4.46	18.92	168	168
200	11.51	25	0.26	6.63	0.780	4.40	18.82	160	63.7
200	11.51	30	0.31	6.73	0.781	4.36	18.97	155	36.4

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: +/- 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance							
	Color:	Clear	Brown	Gray	Other:	Sample Date	8/29/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	Sample Time	1030
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 17	Project # 341.14-104.03
Sample ID MW- 17 _WG_180828	Project ID O'Neals Clothes Depot
Sample Collector(s) MP & LD	PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth 15.82 feet	Screened Interval: NA		1 Well Volume: 0.836
Water Level 10.69 feet	Pump Depth in Well: 13'		3 Well Volumes: 2.509
Water Column 5.13 feet			Well Diameter: 2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.21

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	10.72	5	0.05	7.06	0.728	8.76	23.70	152	30.2
200	10.72	10	0.10	6.89	0.753	7.43	22.23	145	47.0
200	10.72	15	0.15	7.23	0.762	5.39	21.54	111	5.7
200	10.72	20	0.21	7.20	0.763	5.31	21.55	112	5.1

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: +/- 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 8/28/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 1230
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Stabilized at 20 minutes

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID	MW- 19	Project #	341.14-104.03 , 114
Sample ID	MW- 19 _WG_180829	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	19.68 feet	Screened Interval: NA	1 Well Volume:	0.929
Water Level	13.98 feet	Pump Depth in Well: 17'	3 Well Volumes:	2.787
Water Column	5.70 feet		Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.40

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
500	13.98	5	0.13	6.80	0.844	9.64	21.54	204	0.0
200	13.98	10	0.18	6.98	0.886	7.71	21.71	193	368
200	13.98	15	0.23	7.14	0.878	7.37	21.81	186	137
200	13.98	20	0.29	7.17	0.849	4.44	21.78	167	37.3
200	13.98	25	0.34	7.25	0.840	6.51	21.68	155	18.5
200	13.98	30	0.40	7.24	0.846	6.33	21.72	149	11.4

NOTE: Stabilization criteria for range of variation of last three consecutive readings: pH: +/- 0.1 units; Conductivity: +/- 3%; Temperature: +/- 3% Dissolved Oxygen: + 0.2 mg/L or +/- 10% (whichever is greater); Turbidity: +/- 5 NTU or +/- 10% (whichever is greater); ORP: +/- 10mV

SAMPLE COLLECTION

Water Appearance							
	Color:	Clear	Brown	Gray	Other:	Sample Date	8/29/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	Sample Time	1210
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

WILCOX ENVIRONMENTAL ENGINEERING

Well ID MW- 24 | Project # 341.14-104.03

Sample ID MW- 24 _WG_1808 30 | Project ID O'Neals Clothes Depot

Sample Collector(s) JMP & LD | PM J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	19.85 feet	Screened Interval: NA	1 Well Volume:	0.941
Water Level	14.08 feet	Pump Depth in Well: 17'	3 Well Volumes:	2.822
Water Column	5.77 feet		Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 6.31

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	14.13	5	0.05	6.52	0.934	7.19	20.66	172	559
		10	0.10	6.55	0.935	7.16	20.68	172	516
		15	0.15	6.56	0.936	7.15	20.69	172	456
		20	0.21	6.59	0.938	7.05	20.87	172	411
		25	0.26	6.65	0.942	6.88	21.21	175	197
		30	0.31	6.79	0.940	6.77	21.52	177	119

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance						
	Color:	Clear	Brown	Gray	Other:	Sample Date 8/30/2018
	Turbidity:	Clear	Slightly	Very	Other:	
	Odor:	None	Mild	Strong	Other:	Sample Time 0940
	Sheen:	None	Moderate	Heavy	Other:	

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260, Methane	6	CG	40 mL	HCl
Sulfate, Nitrate, Alkalinity	2	plastic	250 mL	unpreserved
BOD	1	plastic	500 mL	unpreserved
Total + Dissolved Fe & Mn	1	plastic	250 mL	HNO_3
COD	1	plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Dup-1 for 114

WILCOX
ENVIRONMENTAL ENGINEERING

Wilcox Environmental Engineering, Inc.
Groundwater Monitoring Form

Well ID	MW- 26	Project #	341.14-104.03
Sample ID	MW- 26 _WG_180829	Project ID	O'Neals Clothes Depot
Sample Collector(s)	JMP & LD	PM	J. Kinman

WATER LEVEL MEASUREMENT

Well Depth	16.60 feet	Screened Interval:	NA	1 Well Volume:	1.015
Water Level	10.37 feet	Pump Depth in Well:	13.60'	3 Well Volumes:	3.046
Water Column	6.23 feet			Well Diameter:	2" / 1" / 4"

WELL PURGE INFORMATION

Purge Method: Low-Flow Stability / Bailer Purge / Bailer Nonpurge / PDB

Total Volume Purged (gallons): 0.31

Decontamination Procedure: Alconox+DI with DI Rinse / Disposal of Bailer and Twine

WELL CAPACITY (Gallons Per Foot): 1" = 0.041 2" = 0.163 4" = 0.653

GROUNDWATER PARAMETERS

Pumping Rate (mL/min)	Depth to Water (ft below TOC)	Pumping Duration (minutes)	Volume Removed (gallons)	pH (standard units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (Celsius)	ORP (mV)	Turbidity (NTUs)
200	10.63	5	0.05	6.91	0.871	5.95	22.22	121	0.0
200	10.63	10	0.10	6.99	0.870	4.25	22.14	118	0.0
200	10.63	15	0.15	7.14	0.864	3.01	21.81	127	1000
200	10.63	20	0.21	7.13	0.869	2.75	21.75	135	242
200	10.63	25	0.26	7.07	0.865	2.40	21.68	134	56.1
200	10.63	30	0.31	7.03	0.861	2.25	21.61	135	48.2

NOTE: Stabilization criteria for range of variation of last three consecutive readings: **pH:** +/- 0.1 units; **Conductivity:** +/- 3%; **Temperature:** +/- 3% **Dissolved Oxygen:** +/- 0.2 mg/L or +/- 10% (whichever is greater); **Turbidity:** +/- 5 NTU or +/- 10% (whichever is greater); **ORP:** +/- 10mV

SAMPLE COLLECTION

Water Appearance							
	Color:	Clear	Brown	Gray	Other:	Sample Date	8/29/2018
	Turbidity:	Clear	Slightly	Very	Other:		
	Odor:	None	Mild	Strong	Other:	Sample Time	1610
	Sheen:	None	Moderate	Heavy	Other:		

Intended Analysis	# Containers	Container Material	Container Volume	Preservation
VOCs 8260 -Meth./Etha/Ethe.	6	CG	40 mL	HCl
Sulfate 9038 - Nitrate 9200 - Alkalinity 310.1	1	Plastic	250 mL	unpreserved
BOD 405.1	1	Plastic	500 mL	unpreserved
Total and Dissolved Fe + Mn	1	Plastic	250 mL	HNO_3
COD 410.1	1	Plastic	250 mL	H_2SO_4

REMARKS/COMMENTS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

September 20, 2018

Mr. Jeremy Kinman
Wilcox Environmental Engineering
1552 Main Street
Suite 100
Indianapolis, IN 46224

RE: Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Dear Mr. Kinman:

Enclosed are the analytical results for sample(s) received by the laboratory on July 30, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report: Issued to replace the report dated 8/7/18. Issued to report Nitrite and Nitrate together for sample 1-8 per client request. kbh092018

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mark E. Davis

Mark Davis
mark.davis@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Ms. Jessica Murphy, Wilcox Environmental Engineering
Data Services, Wilcox

Pace Analytical Services, LLC
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(317)228-3100

CERTIFICATIONS

Project:	O'Neals Cleaners 341.14-104N
Pace Project No.:	50202237

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268	Ohio VAP Certification #: CL-0065
Illinois Certification #: 200074	Oklahoma Certification #: 2017-124
Indiana Certification #: C-49-06	Texas Certification #: T104704355-18-12
Kansas/NELAP Certification #:E-10177	West Virginia Certification #: 330
Kentucky UST Certification #: 80226	Wisconsin Certification #: 999788130
Kentucky WW Certification #:98019	USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50202237001	**MW-09_WG_180730**	Water	07/30/18 09:45	07/30/18 15:50
50202237002	**MW-09D_WG_180730**	Water	07/30/18 09:10	07/30/18 15:50
50202237003	**MW-10_WG_180730**	Water	07/30/18 08:10	07/30/18 15:50
50202237004	**MW-15_WG_180730**	Water	07/30/18 12:00	07/30/18 15:50
50202237005	**MW-15D_WG_180730**	Water	07/30/18 11:10	07/30/18 15:50
50202237006	**MW-19_WG_180730**	Water	07/30/18 13:30	07/30/18 15:50
50202237007	**MW-24_WG_180730**	Water	07/30/18 13:00	07/30/18 15:50
50202237008	**MW-17_WG_180730**	Water	07/30/18 14:45	07/30/18 15:50
50202237009	**TB-01_WD_180730**	Water	07/30/18 14:45	07/30/18 15:50

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SAMPLE ANALYTE COUNT

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab ID	Sample ID	Method	Analysts	Analytes Reported
50202237001	**MW-09_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237002	**MW-09D_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237003	**MW-10_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237004	**MW-15_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237005	**MW-15D_WG_180730**	RSK 175 Modified	CWL	3

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SAMPLE ANALYTE COUNT

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237006	**MW-19_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237007	**MW-24_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237008	**MW-17_WG_180730**	RSK 175 Modified	CWL	3
		EPA 6010	MJC	2
		EPA 6010	MJC	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202237009	**TB-01_WD_180730**	EPA 5030/8260	RSW	75

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SUMMARY OF DETECTION

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50202237001	**MW-09_WG_180730**					
EPA 6010	Iron	1740	ug/L	100	08/06/18 08:17	
EPA 6010	Manganese	61.0	ug/L	10.0	08/06/18 08:17	
EPA 5030/8260	Tetrachloroethene	291	ug/L	5.0	08/01/18 15:55	M5
SM 2320B	Alkalinity, Total as CaCO3	280	mg/L	2.0	08/01/18 17:38	
ASTM D516-90,02	Sulfate	19.9	mg/L	5.0	08/03/18 15:25	
EPA 353.2	Nitrogen, Nitrate	7.9	mg/L	0.20	08/01/18 07:42	
50202237002	**MW-09D_WG_180730**					
EPA 6010	Iron	480	ug/L	100	08/06/18 08:19	
EPA 6010	Manganese	13.8	ug/L	10.0	08/06/18 08:19	
EPA 5030/8260	Tetrachloroethene	82.4	ug/L	5.0	08/01/18 16:27	M5
SM 2320B	Alkalinity, Total as CaCO3	350	mg/L	2.0	08/01/18 17:38	
SM 5210B	BOD, 5 day	2.0	mg/L	2.0	08/06/18 13:13	
ASTM D516-90,02	Sulfate	18.5	mg/L	5.0	08/03/18 15:47	
EPA 353.2	Nitrogen, Nitrate	1.6	mg/L	0.10	08/01/18 07:41	
50202237003	**MW-10_WG_180730**					
EPA 6010	Iron	1260	ug/L	100	08/06/18 08:33	
EPA 6010	Manganese	53.0	ug/L	10.0	08/06/18 08:33	
EPA 5030/8260	Tetrachloroethene	15.2	ug/L	5.0	08/01/18 16:59	M5
SM 2320B	Alkalinity, Total as CaCO3	283	mg/L	2.0	08/01/18 17:38	
ASTM D516-90,02	Sulfate	37.3	mg/L	5.0	08/03/18 15:49	
EPA 353.2	Nitrogen, Nitrate	11.4	mg/L	1.0	08/01/18 07:38	
50202237004	**MW-15_WG_180730**					
EPA 6010	Iron	1200	ug/L	100	08/06/18 08:35	
EPA 6010	Manganese	90.6	ug/L	10.0	08/06/18 08:35	
EPA 6010	Manganese, Dissolved	21.9	ug/L	5.0	08/06/18 09:28	
EPA 5030/8260	Tetrachloroethene	165	ug/L	5.0	08/01/18 17:31	M5
SM 2320B	Alkalinity, Total as CaCO3	288	mg/L	2.0	08/01/18 17:38	
ASTM D516-90,02	Sulfate	18.2	mg/L	5.0	08/03/18 15:52	
EPA 353.2	Nitrogen, Nitrate	7.6	mg/L	0.20	08/01/18 07:44	
50202237005	**MW-15D_WG_180730**					
EPA 6010	Iron	3310	ug/L	100	08/06/18 08:37	
EPA 6010	Manganese	148	ug/L	10.0	08/06/18 08:37	
EPA 6010	Manganese, Dissolved	51.7	ug/L	5.0	08/06/18 09:31	
SM 2320B	Alkalinity, Total as CaCO3	390	mg/L	2.0	08/01/18 17:38	
ASTM D516-90,02	Sulfate	20.2	mg/L	5.0	08/03/18 15:53	
EPA 353.2	Nitrogen, Nitrate	2.0	mg/L	0.10	08/01/18 07:43	
50202237006	**MW-19_WG_180730**					
EPA 6010	Iron	10900	ug/L	100	08/06/18 08:39	
EPA 6010	Manganese	910	ug/L	10.0	08/06/18 08:39	
SM 2320B	Alkalinity, Total as CaCO3	383	mg/L	2.0	08/03/18 11:37	
ASTM D516-90,02	Sulfate	19.7	mg/L	5.0	08/03/18 16:17	
EPA 353.2	Nitrogen, Nitrate	3.4	mg/L	0.10	08/01/18 07:36	
50202237007	**MW-24_WG_180730**					
EPA 6010	Iron	1750	ug/L	100	08/06/18 08:42	

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SUMMARY OF DETECTION

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50202237007	**MW-24_WG_180730**					
EPA 6010	Manganese	170	ug/L	10.0	08/06/18 08:42	
EPA 5030/8260	Tetrachloroethene	79.8	ug/L	5.0	08/01/18 19:07	M5
SM 2320B	Alkalinity, Total as CaCO3	356	mg/L	2.0	08/03/18 11:37	
ASTM D516-90,02	Sulfate	95.4	mg/L	25.0	08/03/18 16:17	
EPA 353.2	Nitrogen, Nitrate	6.7	mg/L	0.20	08/01/18 07:45	
50202237008	**MW-17_WG_180730**					
EPA 6010	Iron	11900	ug/L	100	08/06/18 08:44	
EPA 6010	Manganese	489	ug/L	10.0	08/06/18 08:44	
EPA 5030/8260	Tetrachloroethene	16.7	ug/L	5.0	08/01/18 19:39	M5
SM 2320B	Alkalinity, Total as CaCO3	408	mg/L	2.0	08/03/18 11:37	
ASTM D516-90,02	Sulfate	23.0	mg/L	5.0	08/03/18 16:18	
EPA 353.2	Nitrogen, Nitrate	2.8	mg/L	0.10	08/01/18 07:37	

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **RSK 175 Modified**
Description: RSK 175 Headspace
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for RSK 175 Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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(317)228-3100

PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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Indianapolis, IN 46268
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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **EPA 6010**
Description: 6010 MET ICP, Lab Filtered
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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Indianapolis, IN 46268
(317)228-3100

PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for EPA 5030/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 455156

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

Analyte Comments:

QC Batch: 455156

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2102190)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2102191)
  - 1-Methylnaphthalene
- MW-09D_WG_180730 (Lab ID: 50202237002)
  - 1-Methylnaphthalene
- MW-09_WG_180730 (Lab ID: 50202237001)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

Analyte Comments:

QC Batch: 455156

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- MW-10_WG_180730 (Lab ID: 50202237003)
  - 1-Methylnaphthalene
- MW-15D_WG_180730 (Lab ID: 50202237005)
  - 1-Methylnaphthalene
- MW-15_WG_180730 (Lab ID: 50202237004)
  - 1-Methylnaphthalene
- MW-17_WG_180730 (Lab ID: 50202237008)
  - 1-Methylnaphthalene
- MW-19_WG_180730 (Lab ID: 50202237006)
  - 1-Methylnaphthalene
- MW-24_WG_180730 (Lab ID: 50202237007)
  - 1-Methylnaphthalene
- TB-01_WD_180730 (Lab ID: 50202237009)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **EPA 410.4**
Description: 410.4 COD
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 455117

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50201905007,50202237001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2102002)
  - Chemical Oxygen Demand

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 2102003)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2102004)
  - Chemical Oxygen Demand

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **SM 5210B**
Description: 5210B BOD, 5 day
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for SM 5210B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with SM 5210B with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 455064

B2: Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.

- MW-15D_WG_180730 (Lab ID: 50202237005)
  - BOD, 5 day
- MW-17_WG_180730 (Lab ID: 50202237008)
  - BOD, 5 day

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **ASTM D516-90,02**
Description: ASTM D516-9002 Sulfate Water
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for ASTM D516-90,02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 455513

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50202237001,50202237002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2103475)
  - Sulfate
- MS (Lab ID: 2103477)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Method: **EPA 353.2**
Description: 353.2 Nitrogen, NO2/NO3 unpres
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
8 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-09_WG_180730 **Lab ID: 50202237001** Collected: 07/30/18 09:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 13:44	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 13:44	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 13:44	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**1740**	ug/L	100	1	08/02/18 12:19	08/06/18 08:17	7439-89-6	
Manganese	**61.0**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:17	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:18	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:18	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 15:55	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 15:55	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 15:55	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 15:55	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 15:55	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 15:55	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 15:55	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 15:55	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 15:55	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 15:55	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 15:55	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 15:55	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 15:55	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 15:55	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 15:55	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 15:55	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 15:55	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 15:55	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 15:55	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 15:55	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 15:55	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 15:55	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 15:55	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 15:55	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 15:55	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 15:55	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 15:55	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 15:55	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 15:55	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 15:55	156-59-2	M5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-09_WG_180730 **Lab ID: 50202237001** Collected: 07/30/18 09:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 15:55	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 15:55	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 15:55	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 15:55	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 15:55	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 15:55	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 15:55	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 15:55	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 15:55	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 15:55	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 15:55	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 15:55	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 15:55	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 15:55	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 15:55	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 15:55	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 15:55	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 15:55	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 15:55	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 15:55	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 15:55	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 15:55	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 15:55	79-34-5	M5
Tetrachloroethene	**291**	ug/L	5.0	1		08/01/18 15:55	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 15:55	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 15:55	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 15:55	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 15:55	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 15:55	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 15:55	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 15:55	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 15:55	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 15:55	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 15:55	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 15:55	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 15:55	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	106	%.	89-116	1		08/01/18 15:55	1868-53-7	M5
4-Bromofluorobenzene (S)	95	%.	85-111	1		08/01/18 15:55	460-00-4	M5
Toluene-d8 (S)	92	%.	87-110	1		08/01/18 15:55	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**280**	mg/L	2.0	1		08/01/18 17:38		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-09_WG_180730 **Lab ID: 50202237001** Collected: 07/30/18 09:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 08:11	08/06/18 13:15		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**19.9**	mg/L	5.0	1		08/03/18 15:25	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**7.9**	mg/L	0.20	2		08/01/18 07:42	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.20	2		08/01/18 07:42	14797-65-0	

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-09D_WG_180730 **Lab ID: 50202237002** Collected: 07/30/18 09:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 16:18	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 16:18	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 16:18	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**480**	ug/L	100	1	08/02/18 12:19	08/06/18 08:19	7439-89-6	
Manganese	**13.8**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:19	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:24	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:24	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 16:27	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 16:27	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 16:27	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 16:27	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 16:27	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 16:27	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 16:27	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 16:27	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 16:27	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 16:27	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 16:27	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 16:27	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 16:27	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 16:27	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 16:27	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 16:27	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 16:27	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 16:27	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 16:27	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 16:27	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 16:27	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:27	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:27	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:27	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 16:27	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 16:27	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 16:27	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 16:27	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 16:27	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 16:27	156-59-2	M5

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-09D_WG_180730 **Lab ID: 50202237002** Collected: 07/30/18 09:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 16:27	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 16:27	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 16:27	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 16:27	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 16:27	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 16:27	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 16:27	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 16:27	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 16:27	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 16:27	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 16:27	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 16:27	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 16:27	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 16:27	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 16:27	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 16:27	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 16:27	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 16:27	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 16:27	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 16:27	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 16:27	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 16:27	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 16:27	79-34-5	M5
Tetrachloroethene	**82.4**	ug/L	5.0	1		08/01/18 16:27	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 16:27	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:27	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:27	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 16:27	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 16:27	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 16:27	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 16:27	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 16:27	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 16:27	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 16:27	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 16:27	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 16:27	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	107	%.	89-116	1		08/01/18 16:27	1868-53-7	M5
4-Bromofluorobenzene (S)	97	%.	85-111	1		08/01/18 16:27	460-00-4	M5
Toluene-d8 (S)	94	%.	87-110	1		08/01/18 16:27	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**350**	mg/L	2.0	1		08/01/18 17:38		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-09D_WG_180730 **Lab ID: 50202237002** Collected: 07/30/18 09:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	**2.0**	mg/L	2.0	1	08/01/18 08:11	08/06/18 13:13		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**18.5**	mg/L	5.0	1		08/03/18 15:47	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**1.6**	mg/L	0.10	1		08/01/18 07:41	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/01/18 07:41	14797-65-0	

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-10_WG_180730 **Lab ID: 50202237003** Collected: 07/30/18 08:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 16:37	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 16:37	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 16:37	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**1260**	ug/L	100	1	08/02/18 12:19	08/06/18 08:33	7439-89-6	
Manganese	**53.0**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:33	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:26	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:26	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 16:59	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 16:59	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 16:59	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 16:59	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 16:59	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 16:59	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 16:59	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 16:59	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 16:59	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 16:59	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 16:59	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 16:59	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 16:59	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 16:59	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 16:59	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 16:59	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 16:59	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 16:59	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 16:59	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 16:59	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 16:59	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:59	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:59	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:59	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 16:59	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 16:59	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 16:59	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 16:59	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 16:59	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 16:59	156-59-2	M5

REPORT OF LABORATORY ANALYSIS

ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-10_WG_180730 **Lab ID: 50202237003** Collected: 07/30/18 08:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 16:59	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 16:59	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 16:59	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 16:59	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 16:59	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 16:59	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 16:59	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 16:59	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 16:59	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 16:59	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 16:59	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 16:59	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 16:59	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 16:59	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 16:59	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 16:59	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 16:59	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 16:59	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 16:59	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 16:59	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 16:59	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 16:59	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 16:59	79-34-5	M5
Tetrachloroethene	**15.2**	ug/L	5.0	1		08/01/18 16:59	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 16:59	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:59	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 16:59	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 16:59	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 16:59	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 16:59	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 16:59	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 16:59	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 16:59	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 16:59	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 16:59	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 16:59	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	110	%.	89-116	1		08/01/18 16:59	1868-53-7	M5
4-Bromofluorobenzene (S)	96	%.	85-111	1		08/01/18 16:59	460-00-4	M5
Toluene-d8 (S)	93	%.	87-110	1		08/01/18 16:59	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**283**	mg/L	2.0	1		08/01/18 17:38		

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-10_WG_180730 **Lab ID: 50202237003** Collected: 07/30/18 08:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 07:31	08/06/18 13:13		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**37.3**	mg/L	5.0	1		08/03/18 15:49	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**11.4**	mg/L	1.0	10		08/01/18 07:38	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	1.0	10		08/01/18 07:38	14797-65-0	

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-15_WG_180730 **Lab ID: 50202237004** Collected: 07/30/18 12:00 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 15:01	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 15:01	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 15:01	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**1200**	ug/L	100	1	08/02/18 12:19	08/06/18 08:35	7439-89-6	
Manganese	**90.6**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:35	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:28	7439-89-6	
Manganese, Dissolved	**21.9**	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:28	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 17:31	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 17:31	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 17:31	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 17:31	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 17:31	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 17:31	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 17:31	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 17:31	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 17:31	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 17:31	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 17:31	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 17:31	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 17:31	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 17:31	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 17:31	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 17:31	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 17:31	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 17:31	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 17:31	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 17:31	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 17:31	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 17:31	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 17:31	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 17:31	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 17:31	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 17:31	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 17:31	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 17:31	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 17:31	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 17:31	156-59-2	M5

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-15_WG_180730 **Lab ID: 50202237004** Collected: 07/30/18 12:00 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 17:31	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 17:31	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 17:31	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 17:31	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 17:31	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 17:31	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 17:31	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 17:31	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 17:31	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 17:31	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 17:31	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 17:31	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 17:31	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 17:31	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 17:31	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 17:31	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 17:31	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 17:31	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 17:31	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 17:31	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 17:31	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 17:31	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 17:31	79-34-5	M5
Tetrachloroethene	**165**	ug/L	5.0	1		08/01/18 17:31	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 17:31	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 17:31	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 17:31	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 17:31	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 17:31	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 17:31	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 17:31	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 17:31	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 17:31	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 17:31	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 17:31	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 17:31	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	107	%.	89-116	1		08/01/18 17:31	1868-53-7	M5
4-Bromofluorobenzene (S)	99	%.	85-111	1		08/01/18 17:31	460-00-4	M5
Toluene-d8 (S)	93	%.	87-110	1		08/01/18 17:31	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**288**	mg/L	2.0	1		08/01/18 17:38		

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-15_WG_180730 **Lab ID: 50202237004** Collected: 07/30/18 12:00 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 10:25	08/06/18 13:54		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**18.2**	mg/L	5.0	1		08/03/18 15:52	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**7.6**	mg/L	0.20	2		08/01/18 07:44	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.20	2		08/01/18 07:44	14797-65-0	

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-15D_WG_180730 **Lab ID: 50202237005** Collected: 07/30/18 11:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 17:16	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 17:16	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 17:16	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**3310**	ug/L	100	1	08/02/18 12:19	08/06/18 08:37	7439-89-6	
Manganese	**148**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:37	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:31	7439-89-6	
Manganese, Dissolved	**51.7**	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:31	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 18:03	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 18:03	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 18:03	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 18:03	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 18:03	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 18:03	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 18:03	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 18:03	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 18:03	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 18:03	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 18:03	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 18:03	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 18:03	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 18:03	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 18:03	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 18:03	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 18:03	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 18:03	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 18:03	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 18:03	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 18:03	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:03	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:03	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:03	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 18:03	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 18:03	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 18:03	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 18:03	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 18:03	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 18:03	156-59-2	M5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-15D_WG_180730 **Lab ID: 50202237005** Collected: 07/30/18 11:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 18:03	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 18:03	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 18:03	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 18:03	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 18:03	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 18:03	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 18:03	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 18:03	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 18:03	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 18:03	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 18:03	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 18:03	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 18:03	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 18:03	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 18:03	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 18:03	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 18:03	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 18:03	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 18:03	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 18:03	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 18:03	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 18:03	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 18:03	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		08/01/18 18:03	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 18:03	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:03	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:03	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 18:03	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 18:03	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 18:03	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 18:03	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 18:03	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 18:03	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 18:03	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 18:03	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 18:03	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	109	%.	89-116	1		08/01/18 18:03	1868-53-7	M5
4-Bromofluorobenzene (S)	97	%.	85-111	1		08/01/18 18:03	460-00-4	M5
Toluene-d8 (S)	93	%.	87-110	1		08/01/18 18:03	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**390**	mg/L	2.0	1		08/01/18 17:38		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-15D_WG_180730 **Lab ID: 50202237005** Collected: 07/30/18 11:10 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	6.0	3	08/01/18 10:25	08/06/18 13:52		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**20.2**	mg/L	5.0	1		08/03/18 15:53	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**2.0**	mg/L	0.10	1		08/01/18 07:43	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/01/18 07:43	14797-65-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-19_WG_180730 **Lab ID: 50202237006** Collected: 07/30/18 13:30 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 17:35	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 17:35	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 17:35	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**10900**	ug/L	100	1	08/02/18 12:19	08/06/18 08:39	7439-89-6	
Manganese	**910**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:39	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:33	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:33	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 18:35	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 18:35	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 18:35	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 18:35	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 18:35	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 18:35	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 18:35	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 18:35	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 18:35	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 18:35	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 18:35	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 18:35	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 18:35	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 18:35	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 18:35	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 18:35	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 18:35	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 18:35	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 18:35	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 18:35	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 18:35	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:35	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:35	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:35	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 18:35	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 18:35	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 18:35	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 18:35	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 18:35	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 18:35	156-59-2	M5

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-19_WG_180730 **Lab ID: 50202237006** Collected: 07/30/18 13:30 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 18:35	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 18:35	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 18:35	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 18:35	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 18:35	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 18:35	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 18:35	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 18:35	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 18:35	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 18:35	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 18:35	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 18:35	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 18:35	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 18:35	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 18:35	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 18:35	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 18:35	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 18:35	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 18:35	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 18:35	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 18:35	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 18:35	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 18:35	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		08/01/18 18:35	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 18:35	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:35	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 18:35	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 18:35	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 18:35	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 18:35	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 18:35	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 18:35	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 18:35	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 18:35	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 18:35	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 18:35	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	114	%.	89-116	1		08/01/18 18:35	1868-53-7	M5
4-Bromofluorobenzene (S)	100	%.	85-111	1		08/01/18 18:35	460-00-4	M5
Toluene-d8 (S)	94	%.	87-110	1		08/01/18 18:35	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**383**	mg/L	2.0	1		08/03/18 11:37		

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-19_WG_180730 **Lab ID: 50202237006** Collected: 07/30/18 13:30 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 10:44	08/06/18 13:55		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**19.7**	mg/L	5.0	1		08/03/18 16:17	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**3.4**	mg/L	0.10	1		08/01/18 07:36	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/01/18 07:36	14797-65-0	

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-24_WG_180730 **Lab ID: 50202237007** Collected: 07/30/18 13:00 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 17:54	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 17:54	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 17:54	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**1750**	ug/L	100	1	08/02/18 12:19	08/06/18 08:42	7439-89-6	
Manganese	**170**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:42	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:35	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:35	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 19:07	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 19:07	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 19:07	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 19:07	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 19:07	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 19:07	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 19:07	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 19:07	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 19:07	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 19:07	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 19:07	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 19:07	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 19:07	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 19:07	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 19:07	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 19:07	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 19:07	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 19:07	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 19:07	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 19:07	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 19:07	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:07	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:07	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:07	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 19:07	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 19:07	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 19:07	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 19:07	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 19:07	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 19:07	156-59-2	M5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-24_WG_180730 **Lab ID: 50202237007** Collected: 07/30/18 13:00 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 19:07	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 19:07	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 19:07	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 19:07	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 19:07	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 19:07	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 19:07	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 19:07	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 19:07	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 19:07	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 19:07	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 19:07	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 19:07	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 19:07	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 19:07	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 19:07	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 19:07	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 19:07	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 19:07	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 19:07	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 19:07	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 19:07	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 19:07	79-34-5	M5
Tetrachloroethene	**79.8**	ug/L	5.0	1		08/01/18 19:07	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 19:07	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:07	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:07	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 19:07	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 19:07	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 19:07	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 19:07	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 19:07	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 19:07	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 19:07	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 19:07	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 19:07	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	106	%.	89-116	1		08/01/18 19:07	1868-53-7	M5
4-Bromofluorobenzene (S)	96	%.	85-111	1		08/01/18 19:07	460-00-4	M5
Toluene-d8 (S)	93	%.	87-110	1		08/01/18 19:07	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**356**	mg/L	2.0	1		08/03/18 11:37		

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-24_WG_180730 **Lab ID: 50202237007** Collected: 07/30/18 13:00 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 10:43	08/06/18 13:54		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**95.4**	mg/L	25.0	5		08/03/18 16:17	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**6.7**	mg/L	0.20	2		08/01/18 07:45	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.20	2		08/01/18 07:45	14797-65-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-17_WG_180730 **Lab ID: 50202237008** Collected: 07/30/18 14:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 18:13	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 18:13	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 18:13	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**11900**	ug/L	100	1	08/02/18 12:19	08/06/18 08:44	7439-89-6	
Manganese	**489**	ug/L	10.0	1	08/02/18 12:19	08/06/18 08:44	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/03/18 06:25	08/06/18 09:37	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/03/18 06:25	08/06/18 09:37	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 19:39	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 19:39	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 19:39	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 19:39	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 19:39	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 19:39	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 19:39	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 19:39	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 19:39	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 19:39	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 19:39	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 19:39	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 19:39	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 19:39	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 19:39	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 19:39	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 19:39	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 19:39	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 19:39	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 19:39	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 19:39	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:39	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:39	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:39	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 19:39	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 19:39	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 19:39	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 19:39	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 19:39	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 19:39	156-59-2	M5

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-17_WG_180730 **Lab ID: 50202237008** Collected: 07/30/18 14:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 19:39	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 19:39	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 19:39	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 19:39	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 19:39	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 19:39	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 19:39	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 19:39	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 19:39	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 19:39	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 19:39	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 19:39	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 19:39	98-82-8	M5
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 19:39	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 19:39	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 19:39	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 19:39	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 19:39	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 19:39	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 19:39	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 19:39	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 19:39	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 19:39	79-34-5	M5
Tetrachloroethene	**16.7**	ug/L	5.0	1		08/01/18 19:39	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 19:39	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:39	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 19:39	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 19:39	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 19:39	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 19:39	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 19:39	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 19:39	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 19:39	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 19:39	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 19:39	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 19:39	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	107	%.	89-116	1		08/01/18 19:39	1868-53-7	M5
4-Bromofluorobenzene (S)	98	%.	85-111	1		08/01/18 19:39	460-00-4	M5
Toluene-d8 (S)	92	%.	87-110	1		08/01/18 19:39	2037-26-5	M5
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**408**	mg/L	2.0	1		08/03/18 11:37		

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: MW-17_WG_180730 **Lab ID: 50202237008** Collected: 07/30/18 14:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 11:07	08/02/18 10:23		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	6.0	3	08/01/18 10:47	08/06/18 13:56		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**23.0**	mg/L	5.0	1		08/03/18 16:18	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**2.8**	mg/L	0.10	1		08/01/18 07:37	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/01/18 07:37	14797-65-0	

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: TB-01_WD_180730 **Lab ID: 50202237009** Collected: 07/30/18 14:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/01/18 20:11	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/01/18 20:11	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/01/18 20:11	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/01/18 20:11	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/01/18 20:11	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/01/18 20:11	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/01/18 20:11	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/01/18 20:11	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/01/18 20:11	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/01/18 20:11	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/01/18 20:11	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/01/18 20:11	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/01/18 20:11	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/01/18 20:11	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/01/18 20:11	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/01/18 20:11	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 20:11	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/01/18 20:11	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/01/18 20:11	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/01/18 20:11	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/01/18 20:11	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 20:11	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 20:11	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/01/18 20:11	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/01/18 20:11	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/01/18 20:11	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/01/18 20:11	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/01/18 20:11	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/01/18 20:11	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 20:11	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/01/18 20:11	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 20:11	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/01/18 20:11	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/01/18 20:11	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/01/18 20:11	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 20:11	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/01/18 20:11	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/01/18 20:11	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/01/18 20:11	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/01/18 20:11	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/01/18 20:11	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/01/18 20:11	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/01/18 20:11	98-82-8	M5

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ANALYTICAL RESULTS

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Sample: TB-01_WD_180730 **Lab ID: 50202237009** Collected: 07/30/18 14:45 Received: 07/30/18 15:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		08/01/18 20:11	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/01/18 20:11	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/01/18 20:11	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/01/18 20:11	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/01/18 20:11	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/01/18 20:11	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/01/18 20:11	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/01/18 20:11	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 20:11	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/01/18 20:11	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		08/01/18 20:11	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/01/18 20:11	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 20:11	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/01/18 20:11	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/01/18 20:11	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/01/18 20:11	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/01/18 20:11	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/01/18 20:11	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/01/18 20:11	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/01/18 20:11	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/01/18 20:11	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/01/18 20:11	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/01/18 20:11	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	107	%.	89-116	1		08/01/18 20:11	1868-53-7	M5
4-Bromofluorobenzene (S)	96	%.	85-111	1		08/01/18 20:11	460-00-4	M5
Toluene-d8 (S)	92	%.	87-110	1		08/01/18 20:11	2037-26-5	M5

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455321 Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2102739 Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	08/02/18 13:25	
Ethene	ug/L	ND	10.0	08/02/18 13:25	
Methane	ug/L	ND	10.0	08/02/18 13:25	

LABORATORY CONTROL SAMPLE: 2102740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	1980	2030	103	70-130	
Ethene	ug/L	2250	2390	106	70-130	
Methane	ug/L	1980	2200	111	70-130	

SAMPLE DUPLICATE: 2102741

Parameter	Units	50202237001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	ND		20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 454904 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2101129 | Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	100	08/06/18 08:13	
Manganese	ug/L	ND	10.0	08/06/18 08:13	

LABORATORY CONTROL SAMPLE: 2101130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	9710	97	80-120	
Manganese	ug/L	1000	959	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2101131 2101132

Parameter	Units	50202237002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	480	10000	10000	10100	9910	96	94	75-125	2	20	
Manganese	ug/L	13.8	1000	1000	960	940	95	93	75-125	2	20	

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455247 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2102434 Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	70.0	08/06/18 09:12	
Manganese, Dissolved	ug/L	ND	5.0	08/06/18 09:12	

LABORATORY CONTROL SAMPLE: 2102435

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9500	95	80-120	
Manganese, Dissolved	ug/L	1000	939	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2102436 2102437

Parameter	Units	50202320001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	1010	10000	10000	10300	10600	93	96	75-125	2	20	
Manganese, Dissolved	ug/L	2360	1000	1000	3260	3310	89	95	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455156 Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008, 50202237009

METHOD BLANK: 2102190 Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008, 50202237009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	08/01/18 14:50	M5
1,1,1-Trichloroethane	ug/L	ND	5.0	08/01/18 14:50	M5
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	08/01/18 14:50	M5
1,1,2-Trichloroethane	ug/L	ND	5.0	08/01/18 14:50	M5
1,1-Dichloroethane	ug/L	ND	5.0	08/01/18 14:50	M5
1,1-Dichloroethene	ug/L	ND	5.0	08/01/18 14:50	M5
1,1-Dichloropropene	ug/L	ND	5.0	08/01/18 14:50	M5
1,2,3-Trichlorobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1,2,3-Trichloropropane	ug/L	ND	5.0	08/01/18 14:50	M5
1,2,4-Trichlorobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1,2,4-Trimethylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	08/01/18 14:50	M5
1,2-Dichlorobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1,2-Dichloroethane	ug/L	ND	5.0	08/01/18 14:50	M5
1,2-Dichloropropane	ug/L	ND	5.0	08/01/18 14:50	M5
1,3,5-Trimethylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1,3-Dichlorobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1,3-Dichloropropane	ug/L	ND	5.0	08/01/18 14:50	M5
1,4-Dichlorobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
1-Methylnaphthalene	ug/L	ND	5.0	08/01/18 14:50	M5,N2
2,2-Dichloropropane	ug/L	ND	5.0	08/01/18 14:50	M5
2-Butanone (MEK)	ug/L	ND	25.0	08/01/18 14:50	M5
2-Chlorotoluene	ug/L	ND	5.0	08/01/18 14:50	M5
2-Hexanone	ug/L	ND	25.0	08/01/18 14:50	M5
2-Methylnaphthalene	ug/L	ND	10.0	08/01/18 14:50	M5
4-Chlorotoluene	ug/L	ND	5.0	08/01/18 14:50	M5
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	08/01/18 14:50	M5
Acetone	ug/L	ND	100	08/01/18 14:50	M5
Acrolein	ug/L	ND	50.0	08/01/18 14:50	M5
Acrylonitrile	ug/L	ND	100	08/01/18 14:50	M5
Benzene	ug/L	ND	5.0	08/01/18 14:50	M5
Bromobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
Bromochloromethane	ug/L	ND	5.0	08/01/18 14:50	M5
Bromodichloromethane	ug/L	ND	5.0	08/01/18 14:50	M5
Bromoform	ug/L	ND	5.0	08/01/18 14:50	M5
Bromomethane	ug/L	ND	5.0	08/01/18 14:50	M5
Carbon disulfide	ug/L	ND	10.0	08/01/18 14:50	M5
Carbon tetrachloride	ug/L	ND	5.0	08/01/18 14:50	M5
Chlorobenzene	ug/L	ND	5.0	08/01/18 14:50	M5
Chloroethane	ug/L	ND	5.0	08/01/18 14:50	M5

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

METHOD BLANK: 2102190 Matrix: Water

Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008, 50202237009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloroform	ug/L	ND	5.0	08/01/18 14:50	M5
Chloromethane	ug/L	ND	5.0	08/01/18 14:50	M5
cis-1,2-Dichloroethene	ug/L	ND	5.0	08/01/18 14:50	M5
cis-1,3-Dichloropropene	ug/L	ND	5.0	08/01/18 14:50	M5
Dibromochloromethane	ug/L	ND	5.0	08/01/18 14:50	M5
Dibromomethane	ug/L	ND	5.0	08/01/18 14:50	M5
Dichlorodifluoromethane	ug/L	ND	5.0	08/01/18 14:50	M5
Ethyl methacrylate	ug/L	ND	100	08/01/18 14:50	M5
Ethylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
Hexachloro-1,3-butadiene	ug/L	ND	5.0	08/01/18 14:50	M5
Iodomethane	ug/L	ND	10.0	08/01/18 14:50	M5
Isopropylbenzene (Cumene)	ug/L	ND	5.0	08/01/18 14:50	M5
Methyl-tert-butyl ether	ug/L	ND	4.0	08/01/18 14:50	M5
Methylene Chloride	ug/L	ND	5.0	08/01/18 14:50	M5
n-Butylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
n-Hexane	ug/L	ND	5.0	08/01/18 14:50	M5
n-Propylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
Naphthalene	ug/L	ND	1.7	08/01/18 14:50	M5
p-Isopropyltoluene	ug/L	ND	5.0	08/01/18 14:50	M5
sec-Butylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
Styrene	ug/L	ND	5.0	08/01/18 14:50	M5
tert-Butylbenzene	ug/L	ND	5.0	08/01/18 14:50	M5
Tetrachloroethene	ug/L	ND	5.0	08/01/18 14:50	M5
Toluene	ug/L	ND	5.0	08/01/18 14:50	M5
trans-1,2-Dichloroethene	ug/L	ND	5.0	08/01/18 14:50	M5
trans-1,3-Dichloropropene	ug/L	ND	5.0	08/01/18 14:50	M5
trans-1,4-Dichloro-2-butene	ug/L	ND	100	08/01/18 14:50	M5
Trichloroethene	ug/L	ND	5.0	08/01/18 14:50	M5
Trichlorofluoromethane	ug/L	ND	5.0	08/01/18 14:50	M5
Vinyl acetate	ug/L	ND	50.0	08/01/18 14:50	M5
Vinyl chloride	ug/L	ND	2.0	08/01/18 14:50	M5
Xylene (Total)	ug/L	ND	10.0	08/01/18 14:50	M5
4-Bromofluorobenzene (S)	%.	96	85-111	08/01/18 14:50	M5
Dibromofluoromethane (S)	%.	109	89-116	08/01/18 14:50	M5
Toluene-d8 (S)	%.	93	87-110	08/01/18 14:50	M5

LABORATORY CONTROL SAMPLE: 2102191

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	56.5	113	80-120	M5
1,1,1-Trichloroethane	ug/L	50	55.2	110	74-126	M5
1,1,2,2-Tetrachloroethane	ug/L	50	50.0	100	73-117	M5
1,1,2-Trichloroethane	ug/L	50	51.1	102	74-119	M5

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

LABORATORY CONTROL SAMPLE: 2102191

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	50	45.3	91	72-119	M5
1,1-Dichloroethene	ug/L	50	52.3	105	72-123	M5
1,1-Dichloropropene	ug/L	50	52.4	105	77-125	M5
1,2,3-Trichlorobenzene	ug/L	50	56.5	113	74-125	M5
1,2,3-Trichloropropane	ug/L	50	56.3	113	82-121	M5
1,2,4-Trichlorobenzene	ug/L	50	59.4	119	70-125	M5
1,2,4-Trimethylbenzene	ug/L	50	52.2	104	76-118	M5
1,2-Dibromoethane (EDB)	ug/L	50	58.3	117	80-120	M5
1,2-Dichlorobenzene	ug/L	50	53.0	106	77-117	M5
1,2-Dichloroethane	ug/L	50	50.6	101	69-122	M5
1,2-Dichloropropane	ug/L	50	50.6	101	75-124	M5
1,3,5-Trimethylbenzene	ug/L	50	52.2	104	75-117	M5
1,3-Dichlorobenzene	ug/L	50	53.4	107	76-116	M5
1,3-Dichloropropane	ug/L	50	51.9	104	82-118	M5
1,4-Dichlorobenzene	ug/L	50	53.1	106	74-115	M5
1-Methylnaphthalene	ug/L	50	60.9	122	70-130	M5,N2
2,2-Dichloropropane	ug/L	50	54.9	110	51-133	M5
2-Butanone (MEK)	ug/L	250	262	105	72-147	M5
2-Chlorotoluene	ug/L	50	52.2	104	73-113	M5
2-Hexanone	ug/L	250	229	92	71-132	M5
2-Methylnaphthalene	ug/L	50	59.3	119	69-123	M5
4-Chlorotoluene	ug/L	50	53.6	107	78-118	M5
4-Methyl-2-pentanone (MIBK)	ug/L	250	222	89	89-128	M5
Acetone	ug/L	250	205	82	46-170	M5
Acrolein	ug/L	1000	1030	103	13-200	M5
Acrylonitrile	ug/L	200	183	91	65-130	M5
Benzene	ug/L	50	50.6	101	78-117	M5
Bromobenzene	ug/L	50	50.5	101	66-126	M5
Bromochloromethane	ug/L	50	42.0	84	76-120	M5
Bromodichloromethane	ug/L	50	52.7	105	76-120	M5
Bromoform	ug/L	50	53.6	107	70-124	M5
Bromomethane	ug/L	50	40.0	80	29-181	M5
Carbon disulfide	ug/L	50	49.3	99	66-123	M5
Carbon tetrachloride	ug/L	50	56.3	113	73-132	M5
Chlorobenzene	ug/L	50	53.0	106	79-112	M5
Chloroethane	ug/L	50	60.1	120	59-156	M5
Chloroform	ug/L	50	50.2	100	76-118	M5
Chloromethane	ug/L	50	33.9	68	45-142	M5
cis-1,2-Dichloroethene	ug/L	50	52.6	105	75-117	M5
cis-1,3-Dichloropropene	ug/L	50	51.4	103	77-120	M5
Dibromochloromethane	ug/L	50	54.6	109	78-123	M5
Dibromomethane	ug/L	50	52.9	106	78-122	M5
Dichlorodifluoromethane	ug/L	50	67.1	134	41-168	M5
Ethyl methacrylate	ug/L	200	216	108	75-128	M5
Ethylbenzene	ug/L	50	52.2	104	80-118	M5
Hexachloro-1,3-butadiene	ug/L	50	62.2	124	73-125	M5
Iodomethane	ug/L	100	65.3	65	35-174	M5

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

LABORATORY CONTROL SAMPLE: 2102191

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isopropylbenzene (Cumene)	ug/L	50	55.5	111	81-117	M5
Methyl-tert-butyl ether	ug/L	50	55.9	112	71-124	M5
Methylene Chloride	ug/L	50	49.1	98	59-136	M5
n-Butylbenzene	ug/L	50	52.1	104	72-118	M5
n-Hexane	ug/L	50	52.1	104	60-128	M5
n-Propylbenzene	ug/L	50	50.7	101	75-120	M5
Naphthalene	ug/L	50	56.7	113	67-126	M5
p-Isopropyltoluene	ug/L	50	53.9	108	75-115	M5
sec-Butylbenzene	ug/L	50	52.7	105	76-120	M5
Styrene	ug/L	50	53.5	107	74-121	M5
tert-Butylbenzene	ug/L	50	41.9	84	55-109	M5
Tetrachloroethene	ug/L	50	53.9	108	76-116	M5
Toluene	ug/L	50	45.7	91	77-115	M5
trans-1,2-Dichloroethene	ug/L	50	50.4	101	75-121	M5
trans-1,3-Dichloropropene	ug/L	50	52.9	106	77-121	M5
trans-1,4-Dichloro-2-butene	ug/L	200	197	98	42-128	M5
Trichloroethene	ug/L	50	53.8	108	76-120	M5
Trichlorofluoromethane	ug/L	50	63.7	127	81-141	M5
Vinyl acetate	ug/L	200	187	94	67-131	M5
Vinyl chloride	ug/L	50	53.6	107	64-155	M5
Xylene (Total)	ug/L	150	162	108	78-118	M5
4-Bromofluorobenzene (S)	%.			101	85-111	M5
Dibromofluoromethane (S)	%.			101	89-116	M5
Toluene-d8 (S)	%.			93	87-110	M5

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455128 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005

METHOD BLANK: 2102046 | Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	08/01/18 17:38	

LABORATORY CONTROL SAMPLE: 2102047

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	49.3	99	90-110	

SAMPLE DUPLICATE: 2102048

Parameter	Units	50202077009 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	71.2	70.1	2	20	

SAMPLE DUPLICATE: 2102049

Parameter	Units	50202177001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	687	669	3	20	

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455249 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50202237006, 50202237007, 50202237008

METHOD BLANK: 2102438 Matrix: Water
Associated Lab Samples: 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	08/03/18 11:37	

LABORATORY CONTROL SAMPLE: 2102439

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.4	97	90-110	

SAMPLE DUPLICATE: 2102440

Parameter	Units	50202237007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	356	342	4	20	

SAMPLE DUPLICATE: 2102441

Parameter	Units	50202189003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	866	869	0	20	

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455117 Analysis Method: EPA 410.4
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2102000 Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	10.0	08/02/18 10:23	

LABORATORY CONTROL SAMPLE: 2102001

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	50	50.5	101	90-110	

MATRIX SPIKE SAMPLE: 2102002

Parameter	Units	50201905007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	ND	50	60.3	120	90-110	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2102003 2102004

Parameter	Units	50202237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	ND	50	50	58.7	59.1	115	116	90-110	1	20	M3

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 454859 Analysis Method: SM 5210B
QC Batch Method: SM 5210B Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 50202237001, 50202237002, 50202237003

METHOD BLANK: 2100865 Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	08/06/18 13:07	

LABORATORY CONTROL SAMPLE: 2100867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	202	102	85-115	

SAMPLE DUPLICATE: 2101034

Parameter	Units	50202277001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	35.6	31.9	11	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455064 Analysis Method: SM 5210B
QC Batch Method: SM 5210B Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2101757 Matrix: Water
Associated Lab Samples: 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	08/06/18 13:45	

LABORATORY CONTROL SAMPLE: 2101759

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	206	104	85-115	

SAMPLE DUPLICATE: 2101760

Parameter	Units	50202356001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	30.9	30.5	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455513 | Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 | Analysis Description: ASTM D516-9002 Sulfate Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2103473 | Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	08/03/18 15:21	

LABORATORY CONTROL SAMPLE: 2103474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	21.7	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2103475 2103476

Parameter	Units	50202237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	19.9	20	20	37.6	39.1	89	96	90-110	4	20	M0

MATRIX SPIKE SAMPLE: 2103477

Parameter	Units	50202237002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	18.5	20	31.6	65	90-110	M0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

QC Batch: 455024 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

METHOD BLANK: 2101636 | Matrix: Water
Associated Lab Samples: 50202237001, 50202237002, 50202237003, 50202237004, 50202237005, 50202237006, 50202237007, 50202237008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	08/01/18 07:23	
Nitrogen, Nitrite	mg/L	ND	0.10	08/01/18 07:23	

LABORATORY CONTROL SAMPLE: 2101637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1	1.0	102	90-110	
Nitrogen, Nitrite	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2101638 2101639

Parameter	Units	50202237003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Nitrate	mg/L	11.4	10	10	22.8	23.0	115	116	90-110	1	20	
Nitrogen, Nitrite	mg/L	ND	10	10	10.1	10.1	101	101	90-110	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALIFIERS

Project:	O'Neals Cleaners 341.14-104N
Pace Project No.:	50202237

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 455156

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

B2	Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
M5	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.

Pace Analytical Services, LLC
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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50202237001	**MW-09_WG_180730**	RSK 175 Modified	455321		
50202237002	**MW-09D_WG_180730**	RSK 175 Modified	455321		
50202237003	**MW-10_WG_180730**	RSK 175 Modified	455321		
50202237004	**MW-15_WG_180730**	RSK 175 Modified	455321		
50202237005	**MW-15D_WG_180730**	RSK 175 Modified	455321		
50202237006	**MW-19_WG_180730**	RSK 175 Modified	455321		
50202237007	**MW-24_WG_180730**	RSK 175 Modified	455321		
50202237008	**MW-17_WG_180730**	RSK 175 Modified	455321		
50202237001	**MW-09_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237002	**MW-09D_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237003	**MW-10_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237004	**MW-15_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237005	**MW-15D_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237006	**MW-19_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237007	**MW-24_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237008	**MW-17_WG_180730**	EPA 3010	454904	EPA 6010	455648
50202237001	**MW-09_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237002	**MW-09D_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237003	**MW-10_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237004	**MW-15_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237005	**MW-15D_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237006	**MW-19_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237007	**MW-24_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237008	**MW-17_WG_180730**	EPA 3010	455247	EPA 6010	455642
50202237001	**MW-09_WG_180730**	EPA 5030/8260	455156		
50202237002	**MW-09D_WG_180730**	EPA 5030/8260	455156		
50202237003	**MW-10_WG_180730**	EPA 5030/8260	455156		
50202237004	**MW-15_WG_180730**	EPA 5030/8260	455156		
50202237005	**MW-15D_WG_180730**	EPA 5030/8260	455156		
50202237006	**MW-19_WG_180730**	EPA 5030/8260	455156		
50202237007	**MW-24_WG_180730**	EPA 5030/8260	455156		
50202237008	**MW-17_WG_180730**	EPA 5030/8260	455156		
50202237009	**TB-01_WD_180730**	EPA 5030/8260	455156		
50202237001	**MW-09_WG_180730**	SM 2320B	455128		
50202237002	**MW-09D_WG_180730**	SM 2320B	455128		
50202237003	**MW-10_WG_180730**	SM 2320B	455128		
50202237004	**MW-15_WG_180730**	SM 2320B	455128		
50202237005	**MW-15D_WG_180730**	SM 2320B	455128		
50202237006	**MW-19_WG_180730**	SM 2320B	455249		
50202237007	**MW-24_WG_180730**	SM 2320B	455249		
50202237008	**MW-17_WG_180730**	SM 2320B	455249		
50202237001	**MW-09_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237002	**MW-09D_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237003	**MW-10_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237004	**MW-15_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237005	**MW-15D_WG_180730**	EPA 410.4	455117	EPA 410.4	455302

Pace Analytical Services, LLC
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(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: O'Neals Cleaners 341.14-104N
Pace Project No.: 50202237

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50202237006	**MW-19_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237007	**MW-24_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237008	**MW-17_WG_180730**	EPA 410.4	455117	EPA 410.4	455302
50202237001	**MW-09_WG_180730**	SM 5210B	454859	SM 5210B	455062
50202237002	**MW-09D_WG_180730**	SM 5210B	454859	SM 5210B	455062
50202237003	**MW-10_WG_180730**	SM 5210B	454859	SM 5210B	455062
50202237004	**MW-15_WG_180730**	SM 5210B	455064	SM 5210B	455146
50202237005	**MW-15D_WG_180730**	SM 5210B	455064	SM 5210B	455146
50202237006	**MW-19_WG_180730**	SM 5210B	455064	SM 5210B	455146
50202237007	**MW-24_WG_180730**	SM 5210B	455064	SM 5210B	455146
50202237008	**MW-17_WG_180730**	SM 5210B	455064	SM 5210B	455146
50202237001	**MW-09_WG_180730**	ASTM D516-90,02	455513		
50202237002	**MW-09D_WG_180730**	ASTM D516-90,02	455513		
50202237003	**MW-10_WG_180730**	ASTM D516-90,02	455513		
50202237004	**MW-15_WG_180730**	ASTM D516-90,02	455513		
50202237005	**MW-15D_WG_180730**	ASTM D516-90,02	455513		
50202237006	**MW-19_WG_180730**	ASTM D516-90,02	455513		
50202237007	**MW-24_WG_180730**	ASTM D516-90,02	455513		
50202237008	**MW-17_WG_180730**	ASTM D516-90,02	455513		
50202237001	**MW-09_WG_180730**	EPA 353.2	455024		
50202237002	**MW-09D_WG_180730**	EPA 353.2	455024		
50202237003	**MW-10_WG_180730**	EPA 353.2	455024		
50202237004	**MW-15_WG_180730**	EPA 353.2	455024		
50202237005	**MW-15D_WG_180730**	EPA 353.2	455024		
50202237006	**MW-19_WG_180730**	EPA 353.2	455024		
50202237007	**MW-24_WG_180730**	EPA 353.2	455024		
50202237008	**MW-17_WG_180730**	EPA 353.2	455024		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

2213603

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Wilcox Env.	Report To: Jhinman@wilcoxenv.com	Attention: accountspayable@wilcoxenv.com
Address: 1552 Main St, Suite 100 Speedway, IN	Copy To: Nmiller@wilcoxenv.com dataservices@wilcoxenv.com	Company Name:
		Address:
Email To: Jhinman@wilcoxenv.com	Purchase Order No.: N/A	Pace Quote Reference:
Phone: 317-472-0999 Fax:	Project Name: O'Neal's Cleaners	Pace Project Manager: Mark Davis
Requested Due Date/TAT: Std, II	Project Number: 341.14-104.03 N	Pace Profile #: N/A

REGULATORY AGENCY

☐ NPDES	☑ GROUND WATER	☐ DRINKING WATER
☐ UST	☐ RCRA	☐ OTHER

Site Location STATE: IN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

5020237

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	TIME	COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	VOCs	Methane Ethene Ethane	Total Metals	Dissolved Metals	BOD	COD	Sulfate/Nitrate Alkalinity					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-09_WG_180730	WT	G			7/30/18	0945		11	X	X	X	X						X	X	X	X	X	X	X						001 For total and
2	MW-09D_WG_180730						0910		11	X	X	X	X						X	X	X	X	X	X	X						002 dissolved metals,
3	MW-10_WG_180730						0810		11	X	X	X	X						X	X	X	X	X	X	X						003 iron and manganese
4	MW-15_WG_180730						1200		11	X	X	X	X						X	X	X	X	X	X	X						004 only. Dissolved
5	MW-15D_WG_180730						1110		11	X	X	X	X						X	X	X	X	X	X	X						005 metals need
6	TB-01_WD_180730		—				—		3	~~XX~~			X						X												010 lab filtered
7	MW-19_WG_180730		G				1330		11	X	X	X	X						X	X	X	X	X	X	X						006 by Pace please.
8	MW-24_WG_180730						1300		11	X	X	X	X						X	X	X	X	X	X	X						007
9	MW-17_WG_180730						1445		11	X	X	X	X						X	X	X	X	X	X	X						008
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] / Wilcox	7/30/18	1550	Jason Hiatt	7-30	1550	18.9	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Alexis Lutz

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 7/30/18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 5022237 **Date/Time and Initials of person examining contents:** JHT-30 1550

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ Other ______

Tracking #: ______

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No **Seals Intact:** ☐ Yes ☒ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other ______

Thermometer: 1 2 3 4 5 6 A B C D E F (5 circled) Ice Type: ☒ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☒ Yes ☐ No ☐ N/A

Cooler Temperature: 18.6/18.9 Ice Visible in Sample Containers?: ☐ Yes ☒ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☒ N/A

All discrepancies will be written out in the comments section below.

	Yes	No
Are samples from West Virginia? Document any containers out of temp.		X
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X
Chain of Custody Present:	X	
Chain of Custody Filled Out:	X	
Short Hold Time Analysis (<72hr)?: BOD **Analysis:**	X	
Time 5035A TC placed in Freezer or Short Holds To Lab: 1620		
Rush TAT Requested:		X
Containers Intact?:	X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X	

	Yes	No	N/A
All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted. Circle: HNO3 H2SO4 NaOH NaOH/ZnAc	X		
Dissolved Metals field filtered?:		X	
Headspace Wisconsin Sulfide			X
	Present	Absent	N/A
Residual Chlorine Check (SVOC 625 Pest/PCB 608)			X
Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Headspace in VOA Vials (>6mm):		X	
Trip Blank Present?:	X		
Trip Blank Custody Seals?:	X		

Comments:

Sample Container Count

CLIENT: wilcox

COC PAGE 1 of 1

COC ID# 2213503

Project # 50202237

WO#: 50202237

50202237

Sample Line Item	DG9H / VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	R				Matrix (So... Aqu...)	pH <2	pH >9	pH>12
1	6											2		1	1	1					wt	x		
2	6											2		1	1	1								
3	6											2		1	1	1								
4	6											2		1	1	1								
5	6											2		1	1	1								
6	3																							
7	6											2		1	1	1						x		
8	6											2		1	1	1								
9	6											2		1	1	1								
10																								
11																								
12																								

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

F-IN-Q-270-rev.10,31Aug2017

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

August 08, 2018

Mr. Jeremy Kinman
Wilcox Environmental Engineering
1552 Main Street
Suite 100
Indianapolis, IN 46224

RE: Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Dear Mr. Kinman:

Enclosed are the analytical results for sample(s) received by the laboratory on August 01, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mark E. Davis

Mark Davis
mark.davis@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Ms. Jessica Murphy, Wilcox Environmental Engineering
Data Services, Wilcox

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CERTIFICATIONS

Project:	O'Neal's Clothes Depot 341.14
Pace Project No.:	50202362

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268	Ohio VAP Certification #: CL-0065
Illinois Certification #: 200074	Oklahoma Certification #: 2017-124
Indiana Certification #: C-49-06	Texas Certification #: T104704355-18-12
Kansas/NELAP Certification #:E-10177	West Virginia Certification #: 330
Kentucky UST Certification #: 80226	Wisconsin Certification #: 999788130
Kentucky WW Certification #:98019	USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50202362001	**MW-08_WG_180731**	Water	07/31/18 10:40	08/01/18 08:05
50202362002	**MW-11_WG_180731**	Water	07/31/18 14:30	08/01/18 08:05
50202362003	**MW-16_WG_180731**	Water	07/31/18 09:30	08/01/18 08:05
50202362004	**MW-26_WG_180731**	Water	07/31/18 15:40	08/01/18 08:05
50202362005	**Dup-01_WG_180731**	Water	07/31/18 00:00	08/01/18 08:05
50202362006	**TB-01_WD_180731**	Water	07/31/18 08:00	08/01/18 08:05
50202362007	**EQB-01_WD_180731**	Water	07/31/18 15:00	08/01/18 08:05

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SAMPLE ANALYTE COUNT

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Lab ID	Sample ID	Method	Analysts	Analytes Reported
50202362001	**MW-08_WG_180731**	RSK 175 Modified	CWL	3
		EPA 6010	KJE	2
		EPA 6010	JPK	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202362002	**MW-11_WG_180731**	RSK 175 Modified	CWL	3
		EPA 6010	KJE	2
		EPA 6010	JPK	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202362003	**MW-16_WG_180731**	RSK 175 Modified	CWL	3
		EPA 6010	KJE	2
		EPA 6010	JPK	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202362004	**MW-26_WG_180731**	RSK 175 Modified	CWL	3
		EPA 6010	KJE	2
		EPA 6010	JPK	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202362005	**Dup-01_WG_180731**	RSK 175 Modified	CWL	3

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 6010	KJE	2
		EPA 6010	JPK	2
		EPA 5030/8260	RSW	75
		SM 2320B	SLB	1
		EPA 410.4	SKK	1
		SM 5210B	JRB	1
		ASTM D516-90,02	EAA	1
		EPA 353.2	SLB	2
50202362006	**TB-01_WD_180731**	EPA 5030/8260	RSW	75
50202362007	**EQB-01_WD_180731**	EPA 5030/8260	RSW	75

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SUMMARY OF DETECTION

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50202362001	**MW-08_WG_180731**					
EPA 6010	Manganese	13.5	ug/L	10.0	08/03/18 08:28	
EPA 5030/8260	cis-1,2-Dichloroethene	9.0	ug/L	5.0	08/04/18 00:27	
EPA 5030/8260	Tetrachloroethene	67.8	ug/L	5.0	08/04/18 00:27	
SM 2320B	Alkalinity, Total as CaCO3	271	mg/L	2.0	08/06/18 10:34	
ASTM D516-90,02	Sulfate	23.1	mg/L	5.0	08/03/18 16:18	
EPA 353.2	Nitrogen, NO2 plus NO3	7.5	mg/L	1.0	08/01/18 12:00	
EPA 353.2	Nitrogen, Nitrate	7.6	mg/L	1.0	08/01/18 12:00	
50202362002	**MW-11_WG_180731**					
EPA 6010	Iron	1980	ug/L	100	08/03/18 08:30	
EPA 6010	Manganese	122	ug/L	10.0	08/03/18 08:30	
SM 2320B	Alkalinity, Total as CaCO3	286	mg/L	2.0	08/06/18 10:34	
ASTM D516-90,02	Sulfate	56.2	mg/L	25.0	08/03/18 16:18	
EPA 353.2	Nitrogen, NO2 plus NO3	13.5	mg/L	1.0	08/01/18 12:03	
EPA 353.2	Nitrogen, Nitrate	13.5	mg/L	1.0	08/01/18 12:03	
50202362003	**MW-16_WG_180731**					
EPA 6010	Iron	603	ug/L	100	08/03/18 08:32	
EPA 6010	Manganese	39.0	ug/L	10.0	08/03/18 08:32	
EPA 5030/8260	Tetrachloroethene	18.8	ug/L	5.0	08/04/18 02:34	
SM 2320B	Alkalinity, Total as CaCO3	322	mg/L	2.0	08/06/18 10:34	
ASTM D516-90,02	Sulfate	12.3	mg/L	5.0	08/03/18 16:33	
EPA 353.2	Nitrogen, NO2 plus NO3	2.7	mg/L	0.10	08/01/18 11:59	
EPA 353.2	Nitrogen, Nitrate	2.7	mg/L	0.10	08/01/18 11:59	
50202362004	**MW-26_WG_180731**					
EPA 6010	Iron	625	ug/L	100	08/03/18 08:34	
EPA 6010	Manganese	88.1	ug/L	10.0	08/03/18 08:34	
EPA 6010	Manganese, Dissolved	57.5	ug/L	5.0	08/07/18 22:22	
EPA 5030/8260	Tetrachloroethene	124	ug/L	5.0	08/04/18 03:06	
SM 2320B	Alkalinity, Total as CaCO3	273	mg/L	2.0	08/06/18 10:34	
ASTM D516-90,02	Sulfate	13.3	mg/L	5.0	08/03/18 16:34	
EPA 353.2	Nitrogen, NO2 plus NO3	5.9	mg/L	0.50	08/01/18 12:04	
EPA 353.2	Nitrogen, Nitrate	5.9	mg/L	0.50	08/01/18 12:04	
50202362005	**Dup-01_WG_180731**					
EPA 6010	Iron	480	ug/L	100	08/03/18 08:36	
EPA 6010	Manganese	28.7	ug/L	10.0	08/03/18 08:36	
SM 2320B	Alkalinity, Total as CaCO3	297	mg/L	2.0	08/06/18 10:34	
ASTM D516-90,02	Sulfate	52.4	mg/L	25.0	08/03/18 16:35	
EPA 353.2	Nitrogen, NO2 plus NO3	13.9	mg/L	1.0	08/01/18 11:58	
EPA 353.2	Nitrogen, Nitrate	13.9	mg/L	1.0	08/01/18 11:58	

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **RSK 175 Modified**
Description: RSK 175 Headspace
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for RSK 175 Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project:	O'Neal's Clothes Depot 341.14
Pace Project No.:	50202362

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **EPA 6010**
Description: 6010 MET ICP, Lab Filtered
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
7 samples were analyzed for EPA 5030/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: 455610

L1: Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.

- LCS (Lab ID: 2104082)
    - 1,1,1,2-Tetrachloroethane
    - 1,2-Dibromoethane (EDB)
    - 2-Methylnaphthalene
    - Hexachloro-1,3-butadiene
    - Trichlorofluoromethane

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 455612

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

Analyte Comments:

QC Batch: 455610

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2104081)
  - 1-Methylnaphthalene
- Dup-01_WG_180731 (Lab ID: 50202362005)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2104082)
  - 1-Methylnaphthalene
- MS (Lab ID: 2104083)
  - 1-Methylnaphthalene
- MSD (Lab ID: 2104084)
  - 1-Methylnaphthalene
- MW-08_WG_180731 (Lab ID: 50202362001)
  - 1-Methylnaphthalene
- MW-11_WG_180731 (Lab ID: 50202362002)
  - 1-Methylnaphthalene
- MW-16_WG_180731 (Lab ID: 50202362003)
  - 1-Methylnaphthalene
- MW-26_WG_180731 (Lab ID: 50202362004)
  - 1-Methylnaphthalene

QC Batch: 455612

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2104087)
  - 1-Methylnaphthalene
- EQB-01_WD_180731 (Lab ID: 50202362007)
  - 1-Methylnaphthalene
- TB-01_WD_180731 (Lab ID: 50202362006)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **EPA 410.4**
Description: 410.4 COD
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **SM 5210B**
Description: 5210B BOD, 5 day
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for SM 5210B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with SM 5210B with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 455064

B2: Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.

- Dup-01_WG_180731 (Lab ID: 50202362005)
  - BOD, 5 day
- MW-08_WG_180731 (Lab ID: 50202362001)
  - BOD, 5 day

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **ASTM D516-90,02**
Description: ASTM D516-9002 Sulfate Water
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for ASTM D516-90,02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 455513

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50202237001,50202237002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2103475)
  - Sulfate
- MS (Lab ID: 2103477)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Method: **EPA 353.2**
Description: 353.2 Nitrogen, NO2/NO3 unpres
Client: Wilcox Environmental Engineering, Inc.
Date: August 08, 2018

General Information:
5 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-08_WG_180731 **Lab ID: 50202362001** Collected: 07/31/18 10:40 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 15:40	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 15:40	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 15:40	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	ND	ug/L	100	1	08/02/18 12:19	08/03/18 08:28	7439-89-6	
Manganese	**13.5**	ug/L	10.0	1	08/02/18 12:19	08/03/18 08:28	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/07/18 06:21	08/07/18 22:04	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/07/18 06:21	08/07/18 22:04	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/04/18 00:27	67-64-1	
Acrolein	ND	ug/L	50.0	1		08/04/18 00:27	107-02-8	
Acrylonitrile	ND	ug/L	100	1		08/04/18 00:27	107-13-1	
Benzene	ND	ug/L	5.0	1		08/04/18 00:27	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		08/04/18 00:27	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		08/04/18 00:27	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		08/04/18 00:27	75-27-4	
Bromoform	ND	ug/L	5.0	1		08/04/18 00:27	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/04/18 00:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		08/04/18 00:27	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		08/04/18 00:27	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		08/04/18 00:27	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		08/04/18 00:27	108-90-7	
Chloroethane	ND	ug/L	5.0	1		08/04/18 00:27	75-00-3	
Chloroform	ND	ug/L	5.0	1		08/04/18 00:27	67-66-3	
Chloromethane	ND	ug/L	5.0	1		08/04/18 00:27	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 00:27	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 00:27	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		08/04/18 00:27	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/04/18 00:27	106-93-4	L1
Dibromomethane	ND	ug/L	5.0	1		08/04/18 00:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 00:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 00:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 00:27	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/04/18 00:27	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/04/18 00:27	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		08/04/18 00:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		08/04/18 00:27	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		08/04/18 00:27	75-35-4	
cis-1,2-Dichloroethene	**9.0**	ug/L	5.0	1		08/04/18 00:27	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-08_WG_180731 **Lab ID: 50202362001** Collected: 07/31/18 10:40 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 00:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 00:27	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		08/04/18 00:27	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 00:27	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		08/04/18 00:27	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 00:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 00:27	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		08/04/18 00:27	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/04/18 00:27	87-68-3	L1
n-Hexane	ND	ug/L	5.0	1		08/04/18 00:27	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		08/04/18 00:27	591-78-6	
Iodomethane	ND	ug/L	10.0	1		08/04/18 00:27	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/04/18 00:27	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		08/04/18 00:27	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/04/18 00:27	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		08/04/18 00:27	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/04/18 00:27	91-57-6	L1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/04/18 00:27	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/04/18 00:27	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		08/04/18 00:27	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	103-65-1	
Styrene	ND	ug/L	5.0	1		08/04/18 00:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 00:27	630-20-6	L1
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 00:27	79-34-5	
Tetrachloroethene	**67.8**	ug/L	5.0	1		08/04/18 00:27	127-18-4	
Toluene	ND	ug/L	5.0	1		08/04/18 00:27	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 00:27	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 00:27	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/04/18 00:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/04/18 00:27	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		08/04/18 00:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		08/04/18 00:27	75-69-4	L1
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/04/18 00:27	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 00:27	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		08/04/18 00:27	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		08/04/18 00:27	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		08/04/18 00:27	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	110	%.	89-116	1		08/04/18 00:27	1868-53-7	
4-Bromofluorobenzene (S)	97	%.	85-111	1		08/04/18 00:27	460-00-4	
Toluene-d8 (S)	94	%.	87-110	1		08/04/18 00:27	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**271**	mg/L	2.0	1		08/06/18 10:34		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-08_WG_180731 **Lab ID: 50202362001** Collected: 07/31/18 10:40 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 12:18	08/02/18 11:09		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	6.0	3	08/01/18 12:57	08/06/18 14:24		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**23.1**	mg/L	5.0	1		08/03/18 16:18	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**7.5**	mg/L	1.0	10		08/01/18 12:00		
Nitrogen, Nitrate	**7.6**	mg/L	1.0	10		08/01/18 12:00	14797-55-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-11_WG_180731 **Lab ID: 50202362002** Collected: 07/31/18 14:30 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 14:23	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 14:23	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 14:23	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**1980**	ug/L	100	1	08/02/18 12:19	08/03/18 08:30	7439-89-6	
Manganese	**122**	ug/L	10.0	1	08/02/18 12:19	08/03/18 08:30	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/07/18 06:21	08/07/18 22:14	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/07/18 06:21	08/07/18 22:14	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/04/18 02:02	67-64-1	
Acrolein	ND	ug/L	50.0	1		08/04/18 02:02	107-02-8	
Acrylonitrile	ND	ug/L	100	1		08/04/18 02:02	107-13-1	
Benzene	ND	ug/L	5.0	1		08/04/18 02:02	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		08/04/18 02:02	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		08/04/18 02:02	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		08/04/18 02:02	75-27-4	
Bromoform	ND	ug/L	5.0	1		08/04/18 02:02	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/04/18 02:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		08/04/18 02:02	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		08/04/18 02:02	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		08/04/18 02:02	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		08/04/18 02:02	108-90-7	
Chloroethane	ND	ug/L	5.0	1		08/04/18 02:02	75-00-3	
Chloroform	ND	ug/L	5.0	1		08/04/18 02:02	67-66-3	
Chloromethane	ND	ug/L	5.0	1		08/04/18 02:02	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 02:02	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 02:02	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		08/04/18 02:02	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/04/18 02:02	106-93-4	L1
Dibromomethane	ND	ug/L	5.0	1		08/04/18 02:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:02	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/04/18 02:02	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/04/18 02:02	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		08/04/18 02:02	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		08/04/18 02:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		08/04/18 02:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 02:02	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-11_WG_180731 **Lab ID: 50202362002** Collected: 07/31/18 14:30 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 02:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 02:02	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		08/04/18 02:02	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 02:02	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		08/04/18 02:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 02:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 02:02	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		08/04/18 02:02	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/04/18 02:02	87-68-3	L1
n-Hexane	ND	ug/L	5.0	1		08/04/18 02:02	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		08/04/18 02:02	591-78-6	
Iodomethane	ND	ug/L	10.0	1		08/04/18 02:02	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/04/18 02:02	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		08/04/18 02:02	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/04/18 02:02	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		08/04/18 02:02	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/04/18 02:02	91-57-6	L1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/04/18 02:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/04/18 02:02	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		08/04/18 02:02	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	103-65-1	
Styrene	ND	ug/L	5.0	1		08/04/18 02:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 02:02	630-20-6	L1
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 02:02	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		08/04/18 02:02	127-18-4	
Toluene	ND	ug/L	5.0	1		08/04/18 02:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:02	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:02	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/04/18 02:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/04/18 02:02	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		08/04/18 02:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		08/04/18 02:02	75-69-4	L1
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/04/18 02:02	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 02:02	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		08/04/18 02:02	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		08/04/18 02:02	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		08/04/18 02:02	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	112	%.	89-116	1		08/04/18 02:02	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		08/04/18 02:02	460-00-4	
Toluene-d8 (S)	94	%.	87-110	1		08/04/18 02:02	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**286**	mg/L	2.0	1		08/06/18 10:34		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-11_WG_180731 **Lab ID: 50202362002** Collected: 07/31/18 14:30 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 12:18	08/02/18 11:09		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 12:58	08/06/18 14:25		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**56.2**	mg/L	25.0	5		08/03/18 16:18	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**13.5**	mg/L	1.0	10		08/01/18 12:03		
Nitrogen, Nitrate	**13.5**	mg/L	1.0	10		08/01/18 12:03	14797-55-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14

Pace Project No.: 50202362

Sample: MW-16_WG_180731 **Lab ID: 50202362003** Collected: 07/31/18 09:30 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 14:42	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 14:42	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 14:42	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**603**	ug/L	100	1	08/02/18 12:19	08/03/18 08:32	7439-89-6	
Manganese	**39.0**	ug/L	10.0	1	08/02/18 12:19	08/03/18 08:32	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/07/18 06:21	08/07/18 22:20	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/07/18 06:21	08/07/18 22:20	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/04/18 02:34	67-64-1	
Acrolein	ND	ug/L	50.0	1		08/04/18 02:34	107-02-8	
Acrylonitrile	ND	ug/L	100	1		08/04/18 02:34	107-13-1	
Benzene	ND	ug/L	5.0	1		08/04/18 02:34	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		08/04/18 02:34	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		08/04/18 02:34	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		08/04/18 02:34	75-27-4	
Bromoform	ND	ug/L	5.0	1		08/04/18 02:34	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/04/18 02:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		08/04/18 02:34	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		08/04/18 02:34	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		08/04/18 02:34	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		08/04/18 02:34	108-90-7	
Chloroethane	ND	ug/L	5.0	1		08/04/18 02:34	75-00-3	
Chloroform	ND	ug/L	5.0	1		08/04/18 02:34	67-66-3	
Chloromethane	ND	ug/L	5.0	1		08/04/18 02:34	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 02:34	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 02:34	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		08/04/18 02:34	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/04/18 02:34	106-93-4	L1
Dibromomethane	ND	ug/L	5.0	1		08/04/18 02:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:34	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/04/18 02:34	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/04/18 02:34	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		08/04/18 02:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		08/04/18 02:34	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		08/04/18 02:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 02:34	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-16_WG_180731 **Lab ID: 50202362003** Collected: 07/31/18 09:30 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 02:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 02:34	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		08/04/18 02:34	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 02:34	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		08/04/18 02:34	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 02:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 02:34	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		08/04/18 02:34	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/04/18 02:34	87-68-3	L1
n-Hexane	ND	ug/L	5.0	1		08/04/18 02:34	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		08/04/18 02:34	591-78-6	
Iodomethane	ND	ug/L	10.0	1		08/04/18 02:34	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/04/18 02:34	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		08/04/18 02:34	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/04/18 02:34	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		08/04/18 02:34	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/04/18 02:34	91-57-6	L1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/04/18 02:34	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/04/18 02:34	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		08/04/18 02:34	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	103-65-1	
Styrene	ND	ug/L	5.0	1		08/04/18 02:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 02:34	630-20-6	L1
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 02:34	79-34-5	
Tetrachloroethene	**18.8**	ug/L	5.0	1		08/04/18 02:34	127-18-4	
Toluene	ND	ug/L	5.0	1		08/04/18 02:34	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:34	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 02:34	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/04/18 02:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/04/18 02:34	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		08/04/18 02:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		08/04/18 02:34	75-69-4	L1
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/04/18 02:34	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 02:34	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		08/04/18 02:34	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		08/04/18 02:34	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		08/04/18 02:34	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	114	%.	89-116	1		08/04/18 02:34	1868-53-7	
4-Bromofluorobenzene (S)	96	%.	85-111	1		08/04/18 02:34	460-00-4	
Toluene-d8 (S)	91	%.	87-110	1		08/04/18 02:34	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**322**	mg/L	2.0	1		08/06/18 10:34		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-16_WG_180731 **Lab ID: 50202362003** Collected: 07/31/18 09:30 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 12:18	08/02/18 11:09		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 12:59	08/06/18 14:27		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**12.3**	mg/L	5.0	1		08/03/18 16:33	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**2.7**	mg/L	0.10	1		08/01/18 11:59		
Nitrogen, Nitrate	**2.7**	mg/L	0.10	1		08/01/18 11:59	14797-55-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14

Pace Project No.: 50202362

Sample: MW-26_WG_180731 **Lab ID: 50202362004** Collected: 07/31/18 15:40 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/03/18 12:06	74-84-0	
Ethene	ND	ug/L	10.0	1		08/03/18 12:06	74-85-1	
Methane	ND	ug/L	10.0	1		08/03/18 12:06	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**625**	ug/L	100	1	08/02/18 12:19	08/03/18 08:34	7439-89-6	
Manganese	**88.1**	ug/L	10.0	1	08/02/18 12:19	08/03/18 08:34	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/07/18 06:21	08/07/18 22:22	7439-89-6	
Manganese, Dissolved	**57.5**	ug/L	5.0	1	08/07/18 06:21	08/07/18 22:22	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/04/18 03:06	67-64-1	
Acrolein	ND	ug/L	50.0	1		08/04/18 03:06	107-02-8	
Acrylonitrile	ND	ug/L	100	1		08/04/18 03:06	107-13-1	
Benzene	ND	ug/L	5.0	1		08/04/18 03:06	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		08/04/18 03:06	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		08/04/18 03:06	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		08/04/18 03:06	75-27-4	
Bromoform	ND	ug/L	5.0	1		08/04/18 03:06	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/04/18 03:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		08/04/18 03:06	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		08/04/18 03:06	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		08/04/18 03:06	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		08/04/18 03:06	108-90-7	
Chloroethane	ND	ug/L	5.0	1		08/04/18 03:06	75-00-3	
Chloroform	ND	ug/L	5.0	1		08/04/18 03:06	67-66-3	
Chloromethane	ND	ug/L	5.0	1		08/04/18 03:06	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 03:06	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 03:06	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		08/04/18 03:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/04/18 03:06	106-93-4	L1
Dibromomethane	ND	ug/L	5.0	1		08/04/18 03:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:06	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/04/18 03:06	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/04/18 03:06	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		08/04/18 03:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		08/04/18 03:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		08/04/18 03:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 03:06	156-59-2	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-26_WG_180731 **Lab ID: 50202362004** Collected: 07/31/18 15:40 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 03:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 03:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		08/04/18 03:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 03:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		08/04/18 03:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 03:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 03:06	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		08/04/18 03:06	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/04/18 03:06	87-68-3	L1
n-Hexane	ND	ug/L	5.0	1		08/04/18 03:06	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		08/04/18 03:06	591-78-6	
Iodomethane	ND	ug/L	10.0	1		08/04/18 03:06	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/04/18 03:06	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		08/04/18 03:06	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/04/18 03:06	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		08/04/18 03:06	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/04/18 03:06	91-57-6	L1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/04/18 03:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/04/18 03:06	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		08/04/18 03:06	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	103-65-1	
Styrene	ND	ug/L	5.0	1		08/04/18 03:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 03:06	630-20-6	L1
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 03:06	79-34-5	
Tetrachloroethene	**124**	ug/L	5.0	1		08/04/18 03:06	127-18-4	
Toluene	ND	ug/L	5.0	1		08/04/18 03:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/04/18 03:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/04/18 03:06	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		08/04/18 03:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		08/04/18 03:06	75-69-4	L1
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/04/18 03:06	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 03:06	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		08/04/18 03:06	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		08/04/18 03:06	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		08/04/18 03:06	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	109	%.	89-116	1		08/04/18 03:06	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	85-111	1		08/04/18 03:06	460-00-4	
Toluene-d8 (S)	93	%.	87-110	1		08/04/18 03:06	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**273**	mg/L	2.0	1		08/06/18 10:34		

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: MW-26_WG_180731 **Lab ID: 50202362004** Collected: 07/31/18 15:40 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 12:18	08/02/18 11:09		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/01/18 13:02	08/06/18 14:28		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**13.3**	mg/L	5.0	1		08/03/18 16:34	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**5.9**	mg/L	0.50	5		08/01/18 12:04		
Nitrogen, Nitrate	**5.9**	mg/L	0.50	5		08/01/18 12:04	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: Dup-01_WG_180731 **Lab ID: 50202362005** Collected: 07/31/18 00:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/02/18 15:21	74-84-0	
Ethene	ND	ug/L	10.0	1		08/02/18 15:21	74-85-1	
Methane	ND	ug/L	10.0	1		08/02/18 15:21	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**480**	ug/L	100	1	08/02/18 12:19	08/03/18 08:36	7439-89-6	
Manganese	**28.7**	ug/L	10.0	1	08/02/18 12:19	08/03/18 08:36	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	70.0	1	08/07/18 06:21	08/07/18 22:25	7439-89-6	
Manganese, Dissolved	ND	ug/L	5.0	1	08/07/18 06:21	08/07/18 22:25	7439-96-5	
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/04/18 03:38	67-64-1	
Acrolein	ND	ug/L	50.0	1		08/04/18 03:38	107-02-8	
Acrylonitrile	ND	ug/L	100	1		08/04/18 03:38	107-13-1	
Benzene	ND	ug/L	5.0	1		08/04/18 03:38	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		08/04/18 03:38	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		08/04/18 03:38	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		08/04/18 03:38	75-27-4	
Bromoform	ND	ug/L	5.0	1		08/04/18 03:38	75-25-2	
Bromomethane	ND	ug/L	5.0	1		08/04/18 03:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		08/04/18 03:38	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		08/04/18 03:38	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		08/04/18 03:38	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		08/04/18 03:38	108-90-7	
Chloroethane	ND	ug/L	5.0	1		08/04/18 03:38	75-00-3	
Chloroform	ND	ug/L	5.0	1		08/04/18 03:38	67-66-3	
Chloromethane	ND	ug/L	5.0	1		08/04/18 03:38	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 03:38	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		08/04/18 03:38	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		08/04/18 03:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/04/18 03:38	106-93-4	L1
Dibromomethane	ND	ug/L	5.0	1		08/04/18 03:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:38	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/04/18 03:38	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/04/18 03:38	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		08/04/18 03:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		08/04/18 03:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		08/04/18 03:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 03:38	156-59-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: Dup-01_WG_180731 **Lab ID: 50202362005** Collected: 07/31/18 00:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/04/18 03:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 03:38	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		08/04/18 03:38	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		08/04/18 03:38	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		08/04/18 03:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 03:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/04/18 03:38	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		08/04/18 03:38	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/04/18 03:38	87-68-3	L1
n-Hexane	ND	ug/L	5.0	1		08/04/18 03:38	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		08/04/18 03:38	591-78-6	
Iodomethane	ND	ug/L	10.0	1		08/04/18 03:38	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/04/18 03:38	98-82-8	
p-Isopropyltoluene	ND	ug/L	5.0	1		08/04/18 03:38	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		08/04/18 03:38	75-09-2	
1-Methylnaphthalene	ND	ug/L	5.0	1		08/04/18 03:38	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/04/18 03:38	91-57-6	L1
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/04/18 03:38	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/04/18 03:38	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		08/04/18 03:38	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	103-65-1	
Styrene	ND	ug/L	5.0	1		08/04/18 03:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 03:38	630-20-6	L1
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/04/18 03:38	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		08/04/18 03:38	127-18-4	
Toluene	ND	ug/L	5.0	1		08/04/18 03:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/04/18 03:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/04/18 03:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/04/18 03:38	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		08/04/18 03:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		08/04/18 03:38	75-69-4	L1
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/04/18 03:38	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/04/18 03:38	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		08/04/18 03:38	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		08/04/18 03:38	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		08/04/18 03:38	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	116	%.	89-116	1		08/04/18 03:38	1868-53-7	
4-Bromofluorobenzene (S)	97	%.	85-111	1		08/04/18 03:38	460-00-4	
Toluene-d8 (S)	92	%.	87-110	1		08/04/18 03:38	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**297**	mg/L	2.0	1		08/06/18 10:34		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: Dup-01_WG_180731 **Lab ID: 50202362005** Collected: 07/31/18 00:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	08/01/18 12:18	08/02/18 11:09		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	6.0	3	08/01/18 13:04	08/06/18 14:30		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**52.4**	mg/L	25.0	5		08/03/18 16:35	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**13.9**	mg/L	1.0	10		08/01/18 11:58		
Nitrogen, Nitrate	**13.9**	mg/L	1.0	10		08/01/18 11:58	14797-55-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: TB-01_WD_180731 **Lab ID: 50202362006** Collected: 07/31/18 08:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/03/18 22:04	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/03/18 22:04	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/03/18 22:04	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/03/18 22:04	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/03/18 22:04	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/03/18 22:04	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/03/18 22:04	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/03/18 22:04	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/03/18 22:04	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/03/18 22:04	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/03/18 22:04	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/03/18 22:04	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/03/18 22:04	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/03/18 22:04	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/03/18 22:04	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/03/18 22:04	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/03/18 22:04	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/03/18 22:04	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/03/18 22:04	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/03/18 22:04	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/03/18 22:04	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:04	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:04	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:04	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/03/18 22:04	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/03/18 22:04	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/03/18 22:04	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/03/18 22:04	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/03/18 22:04	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/03/18 22:04	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/03/18 22:04	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/03/18 22:04	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/03/18 22:04	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/03/18 22:04	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/03/18 22:04	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/03/18 22:04	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/03/18 22:04	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/03/18 22:04	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/03/18 22:04	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/03/18 22:04	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/03/18 22:04	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/03/18 22:04	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/03/18 22:04	98-82-8	M5

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: TB-01_WD_180731 **Lab ID: 50202362006** Collected: 07/31/18 08:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		08/03/18 22:04	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/03/18 22:04	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/03/18 22:04	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/03/18 22:04	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/03/18 22:04	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/03/18 22:04	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/03/18 22:04	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/03/18 22:04	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/03/18 22:04	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/03/18 22:04	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		08/03/18 22:04	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/03/18 22:04	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:04	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:04	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/03/18 22:04	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/03/18 22:04	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/03/18 22:04	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/03/18 22:04	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/03/18 22:04	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/03/18 22:04	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/03/18 22:04	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/03/18 22:04	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/03/18 22:04	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	108	%.	89-116	1		08/03/18 22:04	1868-53-7	M5
4-Bromofluorobenzene (S)	99	%.	85-111	1		08/03/18 22:04	460-00-4	M5
Toluene-d8 (S)	94	%.	87-110	1		08/03/18 22:04	2037-26-5	M5

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: EQB-01_WD_180731 **Lab ID: 50202362007** Collected: 07/31/18 15:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		08/03/18 22:35	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		08/03/18 22:35	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		08/03/18 22:35	107-13-1	M5
Benzene	ND	ug/L	5.0	1		08/03/18 22:35	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		08/03/18 22:35	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		08/03/18 22:35	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		08/03/18 22:35	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		08/03/18 22:35	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		08/03/18 22:35	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		08/03/18 22:35	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		08/03/18 22:35	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		08/03/18 22:35	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		08/03/18 22:35	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		08/03/18 22:35	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		08/03/18 22:35	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		08/03/18 22:35	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		08/03/18 22:35	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		08/03/18 22:35	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		08/03/18 22:35	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		08/03/18 22:35	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		08/03/18 22:35	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:35	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:35	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:35	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		08/03/18 22:35	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		08/03/18 22:35	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		08/03/18 22:35	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		08/03/18 22:35	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		08/03/18 22:35	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		08/03/18 22:35	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		08/03/18 22:35	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		08/03/18 22:35	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		08/03/18 22:35	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		08/03/18 22:35	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		08/03/18 22:35	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		08/03/18 22:35	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		08/03/18 22:35	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		08/03/18 22:35	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		08/03/18 22:35	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		08/03/18 22:35	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		08/03/18 22:35	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		08/03/18 22:35	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		08/03/18 22:35	98-82-8	M5

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Sample: EQB-01_WD_180731 **Lab ID: 50202362007** Collected: 07/31/18 15:00 Received: 08/01/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		08/03/18 22:35	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		08/03/18 22:35	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	5.0	1		08/03/18 22:35	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		08/03/18 22:35	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		08/03/18 22:35	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		08/03/18 22:35	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		08/03/18 22:35	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	103-65-1	M5
Styrene	ND	ug/L	5.0	1		08/03/18 22:35	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		08/03/18 22:35	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		08/03/18 22:35	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		08/03/18 22:35	127-18-4	M5
Toluene	ND	ug/L	5.0	1		08/03/18 22:35	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:35	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		08/03/18 22:35	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		08/03/18 22:35	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		08/03/18 22:35	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		08/03/18 22:35	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		08/03/18 22:35	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		08/03/18 22:35	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		08/03/18 22:35	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		08/03/18 22:35	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		08/03/18 22:35	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		08/03/18 22:35	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	107	%.	89-116	1		08/03/18 22:35	1868-53-7	M5
4-Bromofluorobenzene (S)	93	%.	85-111	1		08/03/18 22:35	460-00-4	M5
Toluene-d8 (S)	93	%.	87-110	1		08/03/18 22:35	2037-26-5	M5

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455321 Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362005

METHOD BLANK: 2102739 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	08/02/18 13:25	
Ethene	ug/L	ND	10.0	08/02/18 13:25	
Methane	ug/L	ND	10.0	08/02/18 13:25	

LABORATORY CONTROL SAMPLE: 2102740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	1980	2030	103	70-130	
Ethene	ug/L	2250	2390	106	70-130	
Methane	ug/L	1980	2200	111	70-130	

SAMPLE DUPLICATE: 2102741

Parameter	Units	50202237001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455528 Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 50202362004

METHOD BLANK: 2103553 Matrix: Water
Associated Lab Samples: 50202362004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	08/03/18 11:47	
Ethene	ug/L	ND	10.0	08/03/18 11:47	
Methane	ug/L	ND	10.0	08/03/18 11:47	

LABORATORY CONTROL SAMPLE: 2103554

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	1980	2050	104	70-130	
Ethene	ug/L	2250	2420	107	70-130	
Methane	ug/L	1980	2240	113	70-130	

SAMPLE DUPLICATE: 2103555

Parameter	Units	50202362004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	5J		20	
Methane	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455111 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2101974 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	100	08/03/18 07:55	
Manganese	ug/L	ND	10.0	08/03/18 07:55	

LABORATORY CONTROL SAMPLE: 2101975

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	9510	95	80-120	
Manganese	ug/L	1000	921	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2101976 2101977

Parameter	Units	50202320001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	14800	10000	10000	23900	23800	91	90	75-125	0	20	
Manganese	ug/L	1980	1000	1000	2890	2890	91	91	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455759 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2104606 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	70.0	08/07/18 21:57	
Manganese, Dissolved	ug/L	ND	5.0	08/07/18 21:57	

LABORATORY CONTROL SAMPLE: 2104607

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9550	95	80-120	
Manganese, Dissolved	ug/L	1000	942	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2104608 2104609

Parameter	Units	50202362001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	ND	10000	10000	9730	9580	97	96	75-125	2	20	
Manganese, Dissolved	ug/L	ND	1000	1000	954	939	95	94	75-125	2	20	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455610 — Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 — Analysis Description: 8260 MSV
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2104081 — Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	08/03/18 17:58	
1,1,1-Trichloroethane	ug/L	ND	5.0	08/03/18 17:58	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	08/03/18 17:58	
1,1,2-Trichloroethane	ug/L	ND	5.0	08/03/18 17:58	
1,1-Dichloroethane	ug/L	ND	5.0	08/03/18 17:58	
1,1-Dichloroethene	ug/L	ND	5.0	08/03/18 17:58	
1,1-Dichloropropene	ug/L	ND	5.0	08/03/18 17:58	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	08/03/18 17:58	
1,2,3-Trichloropropane	ug/L	ND	5.0	08/03/18 17:58	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	08/03/18 17:58	
1,2,4-Trimethylbenzene	ug/L	ND	5.0	08/03/18 17:58	
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	08/03/18 17:58	
1,2-Dichlorobenzene	ug/L	ND	5.0	08/03/18 17:58	
1,2-Dichloroethane	ug/L	ND	5.0	08/03/18 17:58	
1,2-Dichloropropane	ug/L	ND	5.0	08/03/18 17:58	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	08/03/18 17:58	
1,3-Dichlorobenzene	ug/L	ND	5.0	08/03/18 17:58	
1,3-Dichloropropane	ug/L	ND	5.0	08/03/18 17:58	
1,4-Dichlorobenzene	ug/L	ND	5.0	08/03/18 17:58	
1-Methylnaphthalene	ug/L	ND	5.0	08/03/18 17:58	N2
2,2-Dichloropropane	ug/L	ND	5.0	08/03/18 17:58	
2-Butanone (MEK)	ug/L	ND	25.0	08/03/18 17:58	
2-Chlorotoluene	ug/L	ND	5.0	08/03/18 17:58	
2-Hexanone	ug/L	ND	25.0	08/03/18 17:58	
2-Methylnaphthalene	ug/L	ND	10.0	08/03/18 17:58	
4-Chlorotoluene	ug/L	ND	5.0	08/03/18 17:58	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	08/03/18 17:58	
Acetone	ug/L	ND	100	08/03/18 17:58	
Acrolein	ug/L	ND	50.0	08/03/18 17:58	
Acrylonitrile	ug/L	ND	100	08/03/18 17:58	
Benzene	ug/L	ND	5.0	08/03/18 17:58	
Bromobenzene	ug/L	ND	5.0	08/03/18 17:58	
Bromochloromethane	ug/L	ND	5.0	08/03/18 17:58	
Bromodichloromethane	ug/L	ND	5.0	08/03/18 17:58	
Bromoform	ug/L	ND	5.0	08/03/18 17:58	
Bromomethane	ug/L	ND	5.0	08/03/18 17:58	
Carbon disulfide	ug/L	ND	10.0	08/03/18 17:58	
Carbon tetrachloride	ug/L	ND	5.0	08/03/18 17:58	
Chlorobenzene	ug/L	ND	5.0	08/03/18 17:58	
Chloroethane	ug/L	ND	5.0	08/03/18 17:58	
Chloroform	ug/L	ND	5.0	08/03/18 17:58	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

METHOD BLANK: 2104081 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloromethane	ug/L	ND	5.0	08/03/18 17:58	
cis-1,2-Dichloroethene	ug/L	ND	5.0	08/03/18 17:58	
cis-1,3-Dichloropropene	ug/L	ND	5.0	08/03/18 17:58	
Dibromochloromethane	ug/L	ND	5.0	08/03/18 17:58	
Dibromomethane	ug/L	ND	5.0	08/03/18 17:58	
Dichlorodifluoromethane	ug/L	ND	5.0	08/03/18 17:58	
Ethyl methacrylate	ug/L	ND	100	08/03/18 17:58	
Ethylbenzene	ug/L	ND	5.0	08/03/18 17:58	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	08/03/18 17:58	
Iodomethane	ug/L	ND	10.0	08/03/18 17:58	
Isopropylbenzene (Cumene)	ug/L	ND	5.0	08/03/18 17:58	
Methyl-tert-butyl ether	ug/L	ND	4.0	08/03/18 17:58	
Methylene Chloride	ug/L	ND	5.0	08/03/18 17:58	
n-Butylbenzene	ug/L	ND	5.0	08/03/18 17:58	
n-Hexane	ug/L	ND	5.0	08/03/18 17:58	
n-Propylbenzene	ug/L	ND	5.0	08/03/18 17:58	
Naphthalene	ug/L	ND	1.7	08/03/18 17:58	
p-Isopropyltoluene	ug/L	ND	5.0	08/03/18 17:58	
sec-Butylbenzene	ug/L	ND	5.0	08/03/18 17:58	
Styrene	ug/L	ND	5.0	08/03/18 17:58	
tert-Butylbenzene	ug/L	ND	5.0	08/03/18 17:58	
Tetrachloroethene	ug/L	ND	5.0	08/03/18 17:58	
Toluene	ug/L	ND	5.0	08/03/18 17:58	
trans-1,2-Dichloroethene	ug/L	ND	5.0	08/03/18 17:58	
trans-1,3-Dichloropropene	ug/L	ND	5.0	08/03/18 17:58	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	08/03/18 17:58	
Trichloroethene	ug/L	ND	5.0	08/03/18 17:58	
Trichlorofluoromethane	ug/L	ND	5.0	08/03/18 17:58	
Vinyl acetate	ug/L	ND	50.0	08/03/18 17:58	
Vinyl chloride	ug/L	ND	2.0	08/03/18 17:58	
Xylene (Total)	ug/L	ND	10.0	08/03/18 17:58	
4-Bromofluorobenzene (S)	%.	96	85-111	08/03/18 17:58	
Dibromofluoromethane (S)	%.	109	89-116	08/03/18 17:58	
Toluene-d8 (S)	%.	93	87-110	08/03/18 17:58	

LABORATORY CONTROL SAMPLE: 2104082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	61.2	122	80-120	L1
1,1,1-Trichloroethane	ug/L	50	58.0	116	74-126	
1,1,2,2-Tetrachloroethane	ug/L	50	52.9	106	73-117	
1,1,2-Trichloroethane	ug/L	50	57.2	114	74-119	
1,1-Dichloroethane	ug/L	50	46.5	93	72-119	
1,1-Dichloroethene	ug/L	50	56.1	112	72-123	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

LABORATORY CONTROL SAMPLE: 2104082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloropropene	ug/L	50	55.1	110	77-125	
1,2,3-Trichlorobenzene	ug/L	50	59.5	119	74-125	
1,2,3-Trichloropropane	ug/L	50	54.4	109	82-121	
1,2,4-Trichlorobenzene	ug/L	50	59.8	120	70-125	
1,2,4-Trimethylbenzene	ug/L	50	53.2	106	76-118	
1,2-Dibromoethane (EDB)	ug/L	50	61.5	123	80-120	L1
1,2-Dichlorobenzene	ug/L	50	56.5	113	77-117	
1,2-Dichloroethane	ug/L	50	54.5	109	69-122	
1,2-Dichloropropane	ug/L	50	51.5	103	75-124	
1,3,5-Trimethylbenzene	ug/L	50	54.4	109	75-117	
1,3-Dichlorobenzene	ug/L	50	55.4	111	76-116	
1,3-Dichloropropane	ug/L	50	53.9	108	82-118	
1,4-Dichlorobenzene	ug/L	50	55.5	111	74-115	
1-Methylnaphthalene	ug/L	50	63.4	127	70-130	N2
2,2-Dichloropropane	ug/L	50	59.0	118	51-133	
2-Butanone (MEK)	ug/L	250	302	121	72-147	
2-Chlorotoluene	ug/L	50	54.4	109	73-113	
2-Hexanone	ug/L	250	240	96	71-132	
2-Methylnaphthalene	ug/L	50	62.0	124	69-123	L1
4-Chlorotoluene	ug/L	50	55.9	112	78-118	
4-Methyl-2-pentanone (MIBK)	ug/L	250	229	92	89-128	
Acetone	ug/L	250	247	99	46-170	
Acrolein	ug/L	1000	1070	107	13-200	
Acrylonitrile	ug/L	200	187	93	65-130	
Benzene	ug/L	50	52.4	105	78-117	
Bromobenzene	ug/L	50	51.5	103	66-126	
Bromochloromethane	ug/L	50	42.3	85	76-120	
Bromodichloromethane	ug/L	50	54.4	109	76-120	
Bromoform	ug/L	50	59.5	119	70-124	
Bromomethane	ug/L	50	56.2	112	29-181	
Carbon disulfide	ug/L	50	51.2	102	66-123	
Carbon tetrachloride	ug/L	50	61.1	122	73-132	
Chlorobenzene	ug/L	50	55.0	110	79-112	
Chloroethane	ug/L	50	62.9	126	59-156	
Chloroform	ug/L	50	53.5	107	76-118	
Chloromethane	ug/L	50	42.5	85	45-142	
cis-1,2-Dichloroethene	ug/L	50	55.0	110	75-117	
cis-1,3-Dichloropropene	ug/L	50	54.4	109	77-120	
Dibromochloromethane	ug/L	50	57.6	115	78-123	
Dibromomethane	ug/L	50	56.5	113	78-122	
Dichlorodifluoromethane	ug/L	50	69.1	138	41-168	
Ethyl methacrylate	ug/L	200	230	115	75-128	
Ethylbenzene	ug/L	50	55.6	111	80-118	
Hexachloro-1,3-butadiene	ug/L	50	64.0	128	73-125	L1
Iodomethane	ug/L	100	111	111	35-174	
Isopropylbenzene (Cumene)	ug/L	50	57.4	115	81-117	
Methyl-tert-butyl ether	ug/L	50	60.4	121	71-124	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

LABORATORY CONTROL SAMPLE: 2104082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	54.0	108	59-136	
n-Butylbenzene	ug/L	50	52.9	106	72-118	
n-Hexane	ug/L	50	52.7	105	60-128	
n-Propylbenzene	ug/L	50	52.0	104	75-120	
Naphthalene	ug/L	50	59.7	119	67-126	
p-Isopropyltoluene	ug/L	50	55.6	111	75-115	
sec-Butylbenzene	ug/L	50	53.8	108	76-120	
Styrene	ug/L	50	57.4	115	74-121	
tert-Butylbenzene	ug/L	50	43.1	86	55-109	
Tetrachloroethene	ug/L	50	56.7	113	76-116	
Toluene	ug/L	50	47.9	96	77-115	
trans-1,2-Dichloroethene	ug/L	50	52.2	104	75-121	
trans-1,3-Dichloropropene	ug/L	50	54.9	110	77-121	
trans-1,4-Dichloro-2-butene	ug/L	200	210	105	42-128	
Trichloroethene	ug/L	50	56.6	113	76-120	
Trichlorofluoromethane	ug/L	50	71.5	143	81-141	L1
Vinyl acetate	ug/L	200	188	94	67-131	
Vinyl chloride	ug/L	50	59.0	118	64-155	
Xylene (Total)	ug/L	150	167	112	78-118	
4-Bromofluorobenzene (S)	%.			98	85-111	
Dibromofluoromethane (S)	%.			104	89-116	
Toluene-d8 (S)	%.			94	87-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2104083 2104084

Parameter	Units	50202362001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	57.8	56.5	116	113	48-138	2	20	
1,1,1-Trichloroethane	ug/L	ND	50	50	58.1	57.8	116	116	50-141	1	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	51.2	49.9	102	100	52-131	3	20	
1,1,2-Trichloroethane	ug/L	ND	50	50	50.9	51.5	102	103	53-131	1	20	
1,1-Dichloroethane	ug/L	ND	50	50	47.4	47.8	95	96	51-130	1	20	
1,1-Dichloroethene	ug/L	ND	50	50	54.5	54.7	109	109	51-138	1	20	
1,1-Dichloropropene	ug/L	ND	50	50	53.9	55.1	108	110	47-143	2	20	
1,2,3-Trichlorobenzene	ug/L	ND	50	50	50.8	49.5	102	99	26-143	3	20	
1,2,3-Trichloropropane	ug/L	ND	50	50	56.7	53.1	113	106	60-136	7	20	
1,2,4-Trichlorobenzene	ug/L	ND	50	50	50.2	48.8	100	98	20-142	3	20	
1,2,4-Trimethylbenzene	ug/L	ND	50	50	44.9	42.7	90	85	19-148	5	20	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	60.4	60.1	121	120	57-134	1	20	
1,2-Dichlorobenzene	ug/L	ND	50	50	48.9	47.7	98	95	30-142	3	20	
1,2-Dichloroethane	ug/L	ND	50	50	54.1	54.4	108	109	46-139	1	20	
1,2-Dichloropropane	ug/L	ND	50	50	50.2	51.5	100	103	54-135	3	20	
1,3,5-Trimethylbenzene	ug/L	ND	50	50	46.3	44.1	93	88	16-149	5	20	
1,3-Dichlorobenzene	ug/L	ND	50	50	46.7	45.9	93	92	24-142	2	20	
1,3-Dichloropropane	ug/L	ND	50	50	53.3	52.2	107	104	59-134	2	20	

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Pace Analytical Services, LLC
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2104083 2104084

Parameter	Units	50202362001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	ug/L	ND	50	50	47.3	45.1	95	90	24-140	5	20	
1-Methylnaphthalene	ug/L	ND	50	50	57.1	56.7	114	113	44-135	1	20	N2
2,2-Dichloropropane	ug/L	ND	50	50	57.9	57.5	116	115	24-138	1	20	
2-Butanone (MEK)	ug/L	ND	250	250	279	276	112	110	49-156	1	20	
2-Chlorotoluene	ug/L	ND	50	50	46.9	44.6	94	89	21-143	5	20	
2-Hexanone	ug/L	ND	250	250	233	228	93	91	53-140	2	20	
2-Methylnaphthalene	ug/L	ND	50	50	52.9	53.2	106	106	33-137	0	20	
4-Chlorotoluene	ug/L	ND	50	50	46.7	45.1	93	90	23-147	3	20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	250	224	223	90	89	50-139	0	20	
Acetone	ug/L	ND	250	250	217	215	87	86	34-160	1	20	
Acrolein	ug/L	ND	1000	1000	936	946	94	95	30-178	1	20	
Acrylonitrile	ug/L	ND	200	200	192	192	96	96	54-136	0	20	
Benzene	ug/L	ND	50	50	52.8	52.1	106	104	50-135	1	20	
Bromobenzene	ug/L	ND	50	50	46.1	46.2	92	92	28-147	0	20	
Bromochloromethane	ug/L	ND	50	50	41.5	43.0	83	86	54-138	4	20	
Bromodichloromethane	ug/L	ND	50	50	55.3	54.5	111	109	50-135	1	20	
Bromoform	ug/L	ND	50	50	56.8	55.1	114	110	43-133	3	20	
Bromomethane	ug/L	ND	50	50	58.6	57.8	117	116	15-170	1	20	
Carbon disulfide	ug/L	ND	50	50	50.7	49.4	101	99	36-139	3	20	
Carbon tetrachloride	ug/L	ND	50	50	60.1	58.8	120	118	43-151	2	20	
Chlorobenzene	ug/L	ND	50	50	50.0	49.9	100	100	39-135	0	20	
Chloroethane	ug/L	ND	50	50	64.8	62.5	130	125	42-165	4	20	
Chloroform	ug/L	ND	50	50	54.2	53.4	108	107	52-134	1	20	
Chloromethane	ug/L	ND	50	50	42.8	42.2	86	84	33-146	1	20	
cis-1,2-Dichloroethene	ug/L	9.0	50	50	63.3	62.3	109	107	48-133	2	20	
cis-1,3-Dichloropropene	ug/L	ND	50	50	50.9	51.0	102	102	46-131	0	20	
Dibromochloromethane	ug/L	ND	50	50	57.6	57.3	115	115	50-139	1	20	
Dibromomethane	ug/L	ND	50	50	54.6	57.2	109	114	55-137	5	20	
Dichlorodifluoromethane	ug/L	ND	50	50	72.1	72.4	144	145	29-178	0	20	
Ethyl methacrylate	ug/L	ND	200	200	214	216	107	108	58-136	1	20	
Ethylbenzene	ug/L	ND	50	50	49.4	46.6	99	93	31-147	6	20	
Hexachloro-1,3-butadiene	ug/L	ND	50	50	48.2	44.4	96	89	10-158	8	20	
Iodomethane	ug/L	ND	100	100	111	108	111	108	17-173	3	20	
Isopropylbenzene (Cumene)	ug/L	ND	50	50	50.9	49.3	102	99	25-151	3	20	
Methyl-tert-butyl ether	ug/L	ND	50	50	60.9	61.5	122	123	51-142	1	20	
Methylene Chloride	ug/L	ND	50	50	51.6	51.8	103	104	41-142	0	20	
n-Butylbenzene	ug/L	ND	50	50	40.4	37.2	81	74	10-153	8	20	
n-Hexane	ug/L	ND	50	50	54.3	54.0	109	108	35-141	1	20	
n-Propylbenzene	ug/L	ND	50	50	43.3	41.3	87	83	16-153	5	20	
Naphthalene	ug/L	ND	50	50	54.5	54.3	109	109	40-135	0	20	
p-Isopropyltoluene	ug/L	ND	50	50	45.0	42.8	90	86	11-150	5	20	
sec-Butylbenzene	ug/L	ND	50	50	44.6	42.0	89	84	11-157	6	20	
Styrene	ug/L	ND	50	50	50.8	49.1	102	98	28-142	3	20	
tert-Butylbenzene	ug/L	ND	50	50	38.3	36.1	77	72	11-132	6	20	
Tetrachloroethene	ug/L	67.8	50	50	115	110	94	84	34-140	4	20	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2104083 2104084

Parameter	Units	50202362001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Toluene	ug/L	ND	50	50	43.9	43.5	88	87	43-134	1	20	
trans-1,2-Dichloroethene	ug/L	ND	50	50	52.7	52.4	105	105	51-135	1	20	
trans-1,3-Dichloropropene	ug/L	ND	50	50	52.5	50.8	105	102	44-133	3	20	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	200	190	187	95	93	12-138	2	20	
Trichloroethene	ug/L	ND	50	50	59.6	58.0	111	108	40-141	3	20	
Trichlorofluoromethane	ug/L	ND	50	50	73.0	72.2	146	144	56-162	1	20	
Vinyl acetate	ug/L	ND	200	200	163	163	82	81	11-134	0	20	
Vinyl chloride	ug/L	ND	50	50	59.8	59.6	120	119	46-164	0	20	
Xylene (Total)	ug/L	ND	150	150	149	145	99	97	29-145	3	20	
4-Bromofluorobenzene (S)	%.						101	100	85-111			
Dibromofluoromethane (S)	%.						104	103	89-116			
Toluene-d8 (S)	%.						93	94	87-110			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455612 Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50202362006, 50202362007

METHOD BLANK: 2104087 Matrix: Water
Associated Lab Samples: 50202362006, 50202362007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
1,1,1-Trichloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
1,1,2-Trichloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
1,1-Dichloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
1,1-Dichloroethene	ug/L	ND	5.0	08/03/18 18:14	M5
1,1-Dichloropropene	ug/L	ND	5.0	08/03/18 18:14	M5
1,2,3-Trichlorobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1,2,3-Trichloropropane	ug/L	ND	5.0	08/03/18 18:14	M5
1,2,4-Trichlorobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1,2,4-Trimethylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	08/03/18 18:14	M5
1,2-Dichlorobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1,2-Dichloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
1,2-Dichloropropane	ug/L	ND	5.0	08/03/18 18:14	M5
1,3,5-Trimethylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1,3-Dichlorobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1,3-Dichloropropane	ug/L	ND	5.0	08/03/18 18:14	M5
1,4-Dichlorobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
1-Methylnaphthalene	ug/L	ND	5.0	08/03/18 18:14	M5,N2
2,2-Dichloropropane	ug/L	ND	5.0	08/03/18 18:14	M5
2-Butanone (MEK)	ug/L	ND	25.0	08/03/18 18:14	M5
2-Chlorotoluene	ug/L	ND	5.0	08/03/18 18:14	M5
2-Hexanone	ug/L	ND	25.0	08/03/18 18:14	M5
2-Methylnaphthalene	ug/L	ND	10.0	08/03/18 18:14	M5
4-Chlorotoluene	ug/L	ND	5.0	08/03/18 18:14	M5
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	08/03/18 18:14	M5
Acetone	ug/L	ND	100	08/03/18 18:14	M5
Acrolein	ug/L	ND	50.0	08/03/18 18:14	M5
Acrylonitrile	ug/L	ND	100	08/03/18 18:14	M5
Benzene	ug/L	ND	5.0	08/03/18 18:14	M5
Bromobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
Bromochloromethane	ug/L	ND	5.0	08/03/18 18:14	M5
Bromodichloromethane	ug/L	ND	5.0	08/03/18 18:14	M5
Bromoform	ug/L	ND	5.0	08/03/18 18:14	M5
Bromomethane	ug/L	ND	5.0	08/03/18 18:14	M5
Carbon disulfide	ug/L	ND	10.0	08/03/18 18:14	M5
Carbon tetrachloride	ug/L	ND	5.0	08/03/18 18:14	M5
Chlorobenzene	ug/L	ND	5.0	08/03/18 18:14	M5
Chloroethane	ug/L	ND	5.0	08/03/18 18:14	M5
Chloroform	ug/L	ND	5.0	08/03/18 18:14	M5

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

METHOD BLANK: 2104087 Matrix: Water
Associated Lab Samples: 50202362006, 50202362007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloromethane	ug/L	ND	5.0	08/03/18 18:14	M5
cis-1,2-Dichloroethene	ug/L	ND	5.0	08/03/18 18:14	M5
cis-1,3-Dichloropropene	ug/L	ND	5.0	08/03/18 18:14	M5
Dibromochloromethane	ug/L	ND	5.0	08/03/18 18:14	M5
Dibromomethane	ug/L	ND	5.0	08/03/18 18:14	M5
Dichlorodifluoromethane	ug/L	ND	5.0	08/03/18 18:14	M5
Ethyl methacrylate	ug/L	ND	100	08/03/18 18:14	M5
Ethylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
Hexachloro-1,3-butadiene	ug/L	ND	5.0	08/03/18 18:14	M5
Iodomethane	ug/L	ND	10.0	08/03/18 18:14	M5
Isopropylbenzene (Cumene)	ug/L	ND	5.0	08/03/18 18:14	M5
Methyl-tert-butyl ether	ug/L	ND	4.0	08/03/18 18:14	M5
Methylene Chloride	ug/L	ND	5.0	08/03/18 18:14	M5
n-Butylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
n-Hexane	ug/L	ND	5.0	08/03/18 18:14	M5
n-Propylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
Naphthalene	ug/L	ND	1.7	08/03/18 18:14	M5
p-Isopropyltoluene	ug/L	ND	5.0	08/03/18 18:14	M5
sec-Butylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
Styrene	ug/L	ND	5.0	08/03/18 18:14	M5
tert-Butylbenzene	ug/L	ND	5.0	08/03/18 18:14	M5
Tetrachloroethene	ug/L	ND	5.0	08/03/18 18:14	M5
Toluene	ug/L	ND	5.0	08/03/18 18:14	M5
trans-1,2-Dichloroethene	ug/L	ND	5.0	08/03/18 18:14	M5
trans-1,3-Dichloropropene	ug/L	ND	5.0	08/03/18 18:14	M5
trans-1,4-Dichloro-2-butene	ug/L	ND	100	08/03/18 18:14	M5
Trichloroethene	ug/L	ND	5.0	08/03/18 18:14	M5
Trichlorofluoromethane	ug/L	ND	5.0	08/03/18 18:14	M5
Vinyl acetate	ug/L	ND	50.0	08/03/18 18:14	M5
Vinyl chloride	ug/L	ND	2.0	08/03/18 18:14	M5
Xylene (Total)	ug/L	ND	10.0	08/03/18 18:14	M5
4-Bromofluorobenzene (S)	%.	98	85-111	08/03/18 18:14	M5
Dibromofluoromethane (S)	%.	111	89-116	08/03/18 18:14	M5
Toluene-d8 (S)	%.	92	87-110	08/03/18 18:14	M5

LABORATORY CONTROL SAMPLE: 2104088

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	61.1	122	74-126	M5
1,1,2,2-Tetrachloroethane	ug/L	50	51.0	102	73-117	M5
1,1-Dichloroethene	ug/L	50	55.7	111	72-123	M5
1,2,4-Trimethylbenzene	ug/L	50	53.8	108	76-118	M5
1,2-Dichloropropane	ug/L	50	50.2	100	75-124	M5
Benzene	ug/L	50	54.1	108	78-117	M5

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Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

LABORATORY CONTROL SAMPLE: 2104088

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chlorobenzene	ug/L	50	54.5	109	79-112	M5
Chloroform	ug/L	50	55.5	111	76-118	M5
cis-1,2-Dichloroethene	ug/L	50	55.8	112	75-117	M5
Ethylbenzene	ug/L	50	54.7	109	80-118	M5
Isopropylbenzene (Cumene)	ug/L	50	57.9	116	81-117	M5
Methyl-tert-butyl ether	ug/L	50	58.4	117	71-124	M5
Naphthalene	ug/L	50	59.0	118	67-126	M5
Tetrachloroethene	ug/L	50	57.7	115	76-116	M5
Toluene	ug/L	50	47.7	95	77-115	M5
trans-1,2-Dichloroethene	ug/L	50	56.2	112	75-121	M5
Trichloroethene	ug/L	50	56.1	112	76-120	M5
Vinyl chloride	ug/L	50	58.1	116	64-155	M5
Xylene (Total)	ug/L	150	167	111	78-118	M5
4-Bromofluorobenzene (S)	%.			99	85-111	M5
Dibromofluoromethane (S)	%.			104	89-116	M5
Toluene-d8 (S)	%.			97	87-110	M5

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455683 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2104346 | Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	08/06/18 10:34	

LABORATORY CONTROL SAMPLE: 2104347

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.6	97	90-110	

SAMPLE DUPLICATE: 2104348

Parameter	Units	50201959001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	111	112	1	20	

SAMPLE DUPLICATE: 2104349

Parameter	Units	50202147003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	345	353	2	20	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455126 Analysis Method: EPA 410.4
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2102030 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	10.0	08/02/18 11:09	

LABORATORY CONTROL SAMPLE: 2102031

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	50	47.9	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2102032 2102033

Parameter	Units	50202362001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	ND	50	50	58.0	57.2	110	109	90-110	1	20	

MATRIX SPIKE SAMPLE: 2102034

Parameter	Units	50202214001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	10.9	50	63.2	104	90-110	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455064 Analysis Method: SM 5210B
QC Batch Method: SM 5210B Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2101757 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	08/06/18 13:45	

LABORATORY CONTROL SAMPLE: 2101759

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	206	104	85-115	

SAMPLE DUPLICATE: 2101760

Parameter	Units	50202356001 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	30.9	30.5	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455513 | Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 | Analysis Description: ASTM D516-9002 Sulfate Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2103473 Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	08/03/18 15:21	

LABORATORY CONTROL SAMPLE: 2103474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	21.7	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2103475 2103476

Parameter	Units	50202237001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	19.9	20	20	37.6	39.1	89	96	90-110	4	20	M0

MATRIX SPIKE SAMPLE: 2103477

Parameter	Units	50202237002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	18.5	20	31.6	65	90-110	M0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

QC Batch: 455093 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

METHOD BLANK: 2101902 — Matrix: Water
Associated Lab Samples: 50202362001, 50202362002, 50202362003, 50202362004, 50202362005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	08/01/18 11:45	
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	08/01/18 11:45	

LABORATORY CONTROL SAMPLE: 2101903

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1	1.1	107	90-110	
Nitrogen, NO2 plus NO3	mg/L	2	2.1	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2101904 — 2101905

Parameter	Units	50202362001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Nitrate	mg/L	7.6	10	10	18.4	18.8	109	112	90-110	2	20	
Nitrogen, NO2 plus NO3	mg/L	7.5	20	20	28.1	28.5	103	105	90-110	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project:	O'Neal's Clothes Depot 341.14
Pace Project No.:	50202362

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 455612

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

B2	Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
L1	Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M5	A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50202362001	**MW-08_WG_180731**	RSK 175 Modified	455321		
50202362002	**MW-11_WG_180731**	RSK 175 Modified	455321		
50202362003	**MW-16_WG_180731**	RSK 175 Modified	455321		
50202362004	**MW-26_WG_180731**	RSK 175 Modified	455528		
50202362005	**Dup-01_WG_180731**	RSK 175 Modified	455321		
50202362001	**MW-08_WG_180731**	EPA 3010	455111	EPA 6010	455462
50202362002	**MW-11_WG_180731**	EPA 3010	455111	EPA 6010	455462
50202362003	**MW-16_WG_180731**	EPA 3010	455111	EPA 6010	455462
50202362004	**MW-26_WG_180731**	EPA 3010	455111	EPA 6010	455462
50202362005	**Dup-01_WG_180731**	EPA 3010	455111	EPA 6010	455462
50202362001	**MW-08_WG_180731**	EPA 3010	455759	EPA 6010	456020
50202362002	**MW-11_WG_180731**	EPA 3010	455759	EPA 6010	456020
50202362003	**MW-16_WG_180731**	EPA 3010	455759	EPA 6010	456020
50202362004	**MW-26_WG_180731**	EPA 3010	455759	EPA 6010	456020
50202362005	**Dup-01_WG_180731**	EPA 3010	455759	EPA 6010	456020
50202362001	**MW-08_WG_180731**	EPA 5030/8260	455610		
50202362002	**MW-11_WG_180731**	EPA 5030/8260	455610		
50202362003	**MW-16_WG_180731**	EPA 5030/8260	455610		
50202362004	**MW-26_WG_180731**	EPA 5030/8260	455610		
50202362005	**Dup-01_WG_180731**	EPA 5030/8260	455610		
50202362006	**TB-01_WD_180731**	EPA 5030/8260	455612		
50202362007	**EQB-01_WD_180731**	EPA 5030/8260	455612		
50202362001	**MW-08_WG_180731**	SM 2320B	455683		
50202362002	**MW-11_WG_180731**	SM 2320B	455683		
50202362003	**MW-16_WG_180731**	SM 2320B	455683		
50202362004	**MW-26_WG_180731**	SM 2320B	455683		
50202362005	**Dup-01_WG_180731**	SM 2320B	455683		
50202362001	**MW-08_WG_180731**	EPA 410.4	455126	EPA 410.4	455304
50202362002	**MW-11_WG_180731**	EPA 410.4	455126	EPA 410.4	455304
50202362003	**MW-16_WG_180731**	EPA 410.4	455126	EPA 410.4	455304
50202362004	**MW-26_WG_180731**	EPA 410.4	455126	EPA 410.4	455304
50202362005	**Dup-01_WG_180731**	EPA 410.4	455126	EPA 410.4	455304
50202362001	**MW-08_WG_180731**	SM 5210B	455064	SM 5210B	455146
50202362002	**MW-11_WG_180731**	SM 5210B	455064	SM 5210B	455146
50202362003	**MW-16_WG_180731**	SM 5210B	455064	SM 5210B	455146
50202362004	**MW-26_WG_180731**	SM 5210B	455064	SM 5210B	455146
50202362005	**Dup-01_WG_180731**	SM 5210B	455064	SM 5210B	455146
50202362001	**MW-08_WG_180731**	ASTM D516-90,02	455513		
50202362002	**MW-11_WG_180731**	ASTM D516-90,02	455513		
50202362003	**MW-16_WG_180731**	ASTM D516-90,02	455513		
50202362004	**MW-26_WG_180731**	ASTM D516-90,02	455513		
50202362005	**Dup-01_WG_180731**	ASTM D516-90,02	455513		
50202362001	**MW-08_WG_180731**	EPA 353.2	455093		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: O'Neal's Clothes Depot 341.14
Pace Project No.: 50202362

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50202362002	**MW-11_WG_180731**	EPA 353.2	455093		
50202362003	**MW-16_WG_180731**	EPA 353.2	455093		
50202362004	**MW-26_WG_180731**	EPA 353.2	455093		
50202362005	**Dup-01_WG_180731**	EPA 353.2	455093		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2213605

Section A Required Client Information:

Company:	Wilcox Environmental Engineering
Address:	1552 Main Street, Speedway IN 46224
Email To:	JKinman@wilcoxenv.com
Phone:	317-472-0499
Fax:	
Requested Due Date/TAT:	Normal

Section B Required Project Information:

Report To:	JKinman@wilcoxenv.com
Copy To:	NMuller@wilcoxenv.com
Purchase Order No.:	
Project Name:	O'Neal's Clothes Depot
Project Number:	34114

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Mark Davis
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: IN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

Residual Chlorine (Y/N): 50202362

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	VOCs 8260	Methane, Ethane, Ethene	Total Metals	Dissolved Metals	BOD	COD	Sulfate, Nitrate, Alkalinity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-08-WG-180731	WT	G			7-31-18	1040		11	X	X	X	X						X	X	X	X	X	X	X		001 Total and dissolved
2	MW-11-WG-180731	WT	G			7-31-18	1430		11	X	X	X	X						X	X	X	X	X	X	X		002 metals analyze for
3	MW-16-WG-180731	WT	G			7-31-18	930		11	X	X	X	X						X	X	X	X	X	X	X		003 Iron & Manganese
4	MW-26-WG-180731	WT	G			7-31-18	1540		11	X	X	X	X						X	X	X	X	X	X	X		004 only. Dissolved metals
5	Dup-01-WG-180731	WT	G			7-31-18	0000		11	X	X	X	X						X	X	X	X	X	X	X		005 need lab filtered
6	TB-01-WD-180731	WT	—			7-31-18	—		3				X						X								006 by Pace.
7	EQB-01-WD-180731	WT	G			7-31-18	1500		3				X						X								007
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature]	8-1-18	8:05	[signature]	8-1	8:05	0.4	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Oliver Purcell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 8-1-18

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 5020236 2

Date/Time and Initials of person examining contents: JH 8-1 958

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No **Seals Intact:** ☐ Yes ☒ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: ☒ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☒ No ☐ N/A

Cooler Temperature: ~~0.6~~ 0.4 Ice Visible in Sample Containers?: ☐ Yes ☒ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☒ N/A

All discrepancies will be written out in the comments section below.

	Yes	No
Are samples from West Virginia? Document any containers out of temp.		X
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		X
Chain of Custody Present:	X	
Chain of Custody Filled Out:	X	
Short Hold Time Analysis (<72hr)?: Analysis: BOD nitrate	X	
Time 5035A TC placed in Freezer or Short Holds To Lab: 1010		
Rush TAT Requested:		✓
Containers Intact?:	X	
Sample Labels Match COC?: Except TCs, which only require sample ID	X	

	Yes	No	N/A
All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (≤2, >9, >12) unless otherwise noted. Circle: HNO3 H2SO4 NaOH NaOH/ZnAc	X		
Dissolved Metals field filtered?:		X	
Headspace Wisconsin Sulfide			X
	Present	**Absent**	**N/A**
Residual Chlorine Check (SVOC 625 Pest/PCB 608)			X
Residual Chlorine Check (Total/Amenable/Free Cyanide)			X
Headspace in VOA Vials (>6mm):		X	
Trip Blank Present?:	X		
Trip Blank Custody Seals?:		X	

Comments:

Sample Container Count

WO# : 50202362

50202362

CLIENT: Wilcox

COC PAGE 1 of 1

COC ID# 2213605

Project # 50202362

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bu Ki R				Matr (Soil Aqu	pH <2	pH >9	pH>12
1	6											2		1	1	1					WT	X		
2	6											2		1	1	1								
3	6											2		1	1	1								
4	6											2		1	1	1								
5	6											2		1	1	1								
6	3																							
7	3																							
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

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September 20, 2018

Mr. Jeremy Kinman
Wilcox Environmental Engineering
1552 Main Street
Suite 100
Indianapolis, IN 46224

RE: Project: Oneals 341.104-03
Pace Project No.: 50204501

Dear Mr. Kinman:

Enclosed are the analytical results for sample(s) received by the laboratory on August 29, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report: Issued to replace the report dated 9/7/18. Issued to report Nitrite and Nitrate together for sample 1-9 per client request. kbh092018

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mark E. Davis

Mark Davis
mark.davis@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Ms. Jessica Murphy, Wilcox Environmental Engineering
Data Services, Wilcox

CERTIFICATIONS

Project:	Oneals 341.104-03
Pace Project No.:	50204501

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas/NELAP Certification #:E-10177
Kentucky UST Certification #: 80226
Kentucky WW Certification #:98019
Ohio VAP Certification #: CL-0065
Oklahoma Certification #: 2017-124
Texas Certification #: T104704355-18-12
West Virginia Certification #: 330
Wisconsin Certification #: 999788130
USDA Soil Permit #: P330-16-00257

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SAMPLE SUMMARY

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50204501001	**MW-08_WG_180828**	Water	08/28/18 15:20	08/29/18 17:55
50204501002	**MW-09_WG_180829**	Water	08/29/18 14:25	08/29/18 17:55
50204501003	**MW-09D_WG_180829**	Water	08/29/18 13:30	08/29/18 17:55
50204501004	**MW-10_WG_180829**	Water	08/29/18 14:15	08/29/18 17:55
50204501005	**MW-11_WG_180828**	Water	08/28/18 11:20	08/29/18 17:55
50204501006	**MW-16_WG_180829**	Water	08/29/18 10:30	08/29/18 17:55
50204501007	**MW-17_WG_180828**	Water	08/28/18 12:30	08/29/18 17:55
50204501008	**MW-19_WG_180829**	Water	08/29/18 12:10	08/29/18 17:55
50204501009	**MW-26_WG_180829**	Water	08/29/18 16:10	08/29/18 17:55
50204501010	**TB-01_WD_180829**	Water	08/29/18 00:00	08/29/18 17:55

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SAMPLE ANALYTE COUNT

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab ID	Sample ID	Method	Analysts	Analytes Reported
50204501001	**MW-08_WG_180828**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501002	**MW-09_WG_180829**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501003	**MW-09D_WG_180829**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501004	**MW-10_WG_180829**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	SCM	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501005	**MW-11_WG_180828**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1

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SAMPLE ANALYTE COUNT

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501006	**MW-16_WG_180829**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501007	**MW-17_WG_180828**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501008	**MW-19_WG_180829**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501009	**MW-26_WG_180829**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	JRB	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204501010	**TB-01_WD_180829**	EPA 5030/8260	ALA	75

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SUMMARY OF DETECTION

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50204501001	**MW-08_WG_180828**					
EPA 6010	Iron	551	ug/L	100	09/04/18 23:53	
EPA 6010	Manganese	287	ug/L	10.0	09/04/18 23:53	
SM 2320B	Alkalinity, Total as CaCO3	280	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	23.0	mg/L	5.0	08/30/18 12:32	
EPA 353.2	Nitrogen, Nitrate	7.6	mg/L	0.50	08/30/18 08:47	
50204501002	**MW-09_WG_180829**					
RSK 175 Modified	Methane	11.6	ug/L	10.0	08/30/18 14:26	
EPA 6010	Iron	6800	ug/L	100	09/04/18 23:55	
EPA 6010	Manganese	1780	ug/L	10.0	09/04/18 23:55	
EPA 6010	Manganese, Dissolved	1680	ug/L	10.0	09/05/18 09:35	
SM 2320B	Alkalinity, Total as CaCO3	297	mg/L	2.0	09/04/18 13:51	
EPA 410.4	Chemical Oxygen Demand	66.0	mg/L	20.0	09/04/18 13:21	
ASTM D516-90,02	Sulfate	30.8	mg/L	5.0	08/30/18 12:48	
EPA 353.2	Nitrogen, Nitrate	4.6	mg/L	0.10	08/30/18 08:50	
EPA 353.2	Nitrogen, Nitrite	0.37	mg/L	0.10	08/30/18 08:50	
50204501003	**MW-09D_WG_180829**					
EPA 6010	Iron	3620	ug/L	100	09/04/18 23:57	
EPA 6010	Manganese	418	ug/L	10.0	09/04/18 23:57	
EPA 6010	Manganese, Dissolved	197	ug/L	10.0	09/05/18 09:37	
SM 2320B	Alkalinity, Total as CaCO3	391	mg/L	2.0	09/04/18 13:51	
EPA 410.4	Chemical Oxygen Demand	20.7	mg/L	10.0	09/04/18 13:21	
ASTM D516-90,02	Sulfate	24.2	mg/L	5.0	08/30/18 12:53	
EPA 353.2	Nitrogen, Nitrate	0.45	mg/L	0.10	08/30/18 08:51	
50204501004	**MW-10_WG_180829**					
RSK 175 Modified	Methane	34.1	ug/L	10.0	08/30/18 15:04	
EPA 6010	Iron	20700	ug/L	100	09/05/18 00:00	
EPA 6010	Manganese	2430	ug/L	10.0	09/05/18 00:00	
EPA 6010	Manganese, Dissolved	1930	ug/L	10.0	09/05/18 09:53	
SM 2320B	Alkalinity, Total as CaCO3	520	mg/L	2.0	09/05/18 10:29	
EPA 410.4	Chemical Oxygen Demand	75.7	mg/L	10.0	09/04/18 13:21	
ASTM D516-90,02	Sulfate	37.1	mg/L	10.0	08/30/18 12:57	
EPA 353.2	Nitrogen, Nitrate	1.7	mg/L	0.10	08/30/18 08:52	
EPA 353.2	Nitrogen, Nitrite	0.40	mg/L	0.10	08/30/18 08:52	
50204501005	**MW-11_WG_180828**					
EPA 6010	Iron	994	ug/L	100	09/05/18 00:06	
EPA 6010	Manganese	79.4	ug/L	10.0	09/05/18 00:06	
SM 2320B	Alkalinity, Total as CaCO3	313	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	73.3	mg/L	10.0	08/30/18 13:02	
EPA 353.2	Nitrogen, Nitrate	11.7	mg/L	1.0	08/30/18 09:00	
50204501006	**MW-16_WG_180829**					
EPA 6010	Iron	1120	ug/L	100	09/05/18 00:08	
EPA 6010	Manganese	136	ug/L	10.0	09/05/18 00:08	
SM 2320B	Alkalinity, Total as CaCO3	378	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	13.9	mg/L	5.0	08/30/18 13:10	

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SUMMARY OF DETECTION

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50204501006	**MW-16_WG_180829**					
EPA 353.2	Nitrogen, Nitrate	2.4	mg/L	0.10	08/30/18 09:01	
50204501007	**MW-17_WG_180828**					
EPA 6010	Iron	351	ug/L	100	09/05/18 00:10	
EPA 6010	Manganese	35.2	ug/L	10.0	09/05/18 00:10	
SM 2320B	Alkalinity, Total as CaCO3	312	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	25.8	mg/L	5.0	08/30/18 13:12	
EPA 353.2	Nitrogen, Nitrate	6.9	mg/L	0.50	08/30/18 09:02	
50204501008	**MW-19_WG_180829**					
EPA 6010	Iron	791	ug/L	100	09/05/18 00:12	
EPA 6010	Manganese	195	ug/L	10.0	09/05/18 00:12	
SM 2320B	Alkalinity, Total as CaCO3	343	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	52.1	mg/L	10.0	08/30/18 13:15	
EPA 353.2	Nitrogen, Nitrate	7.3	mg/L	0.20	08/30/18 09:03	
50204501009	**MW-26_WG_180829**					
EPA 6010	Iron	45000	ug/L	100	09/05/18 00:14	
EPA 6010	Manganese	423	ug/L	10.0	09/05/18 00:14	
EPA 6010	Manganese, Dissolved	354	ug/L	10.0	09/05/18 10:05	
SM 2320B	Alkalinity, Total as CaCO3	312	mg/L	2.0	09/04/18 13:51	
EPA 410.4	Chemical Oxygen Demand	46.8	mg/L	20.0	09/04/18 13:21	
ASTM D516-90,02	Sulfate	15.8	mg/L	5.0	08/30/18 13:17	
EPA 353.2	Nitrogen, Nitrate	9.2	mg/L	1.0	08/30/18 09:04	

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **RSK 175 Modified**
Description: RSK 175 Headspace
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for RSK 175 Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project:	Oneals 341.104-03
Pace Project No.:	50204501

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **EPA 6010**
Description: 6010 MET ICP, Lab Filtered
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
1 sample was analyzed for EPA 5030/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 460127

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50204676008

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2123203)
    - Chloromethane

R1: RPD value was outside control limits.

- MSD (Lab ID: 2123203)
    - Chloromethane

Additional Comments:

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

Analyte Comments:

QC Batch: 460127

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2123200)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2123201)
  - 1-Methylnaphthalene
- MS (Lab ID: 2123202)
  - 1-Methylnaphthalene
- MSD (Lab ID: 2123203)
  - 1-Methylnaphthalene
- TB-01_WD_180829 (Lab ID: 50204501010)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **EPA 410.4**
Description: 410.4 COD
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 459915

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50204483001,50204501005

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2122423)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2122422)
  - Chemical Oxygen Demand

Additional Comments:

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **SM 5210B**
Description: 5210B BOD, 5 day
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for SM 5210B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with SM 5210B with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 459252

B2: Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.

- MW-08_WG_180828 (Lab ID: 50204501001)
  - BOD, 5 day
- MW-09D_WG_180829 (Lab ID: 50204501003)
  - BOD, 5 day
- MW-09_WG_180829 (Lab ID: 50204501002)
  - BOD, 5 day
- MW-10_WG_180829 (Lab ID: 50204501004)
  - BOD, 5 day
- MW-11_WG_180828 (Lab ID: 50204501005)
  - BOD, 5 day
- MW-16_WG_180829 (Lab ID: 50204501006)
  - BOD, 5 day
- MW-17_WG_180828 (Lab ID: 50204501007)
  - BOD, 5 day
- MW-19_WG_180829 (Lab ID: 50204501008)
  - BOD, 5 day

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **SM 5210B**
Description: 5210B BOD, 5 day
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

Analyte Comments:

QC Batch: 459460

B2: Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.

- MW-26_WG_180829 (Lab ID: 50204501009)
    - BOD, 5 day

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **ASTM D516-90,02**
Description: ASTM D516-9002 Sulfate Water
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for ASTM D516-90,02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 459423

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50204501001,50204518002

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2120127)
  - Sulfate

M3: Matrix spike recovery was outside laboratory control limits due to matrix interferences.

- MS (Lab ID: 2120058)
  - Sulfate
- MSD (Lab ID: 2120059)
  - Sulfate

Additional Comments:

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PROJECT NARRATIVE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Method: **EPA 353.2**
Description: 353.2 Nitrogen, NO2/NO3 unpres
Client: Wilcox Environmental Engineering, Inc.
Date: September 20, 2018

General Information:
9 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-08_WG_180828 **Lab ID: 50204501001** Collected: 08/28/18 15:20 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 13:47	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 13:47	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 13:47	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**551**	ug/L	100	1	09/04/18 06:13	09/04/18 23:53	7439-89-6	
Manganese	**287**	ug/L	10.0	1	09/04/18 06:13	09/04/18 23:53	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 09:33	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 09:33	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**280**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 11:08	09/04/18 14:05		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**23.0**	mg/L	5.0	1		08/30/18 12:32	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**7.6**	mg/L	0.50	5		08/30/18 08:47	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.50	5		08/30/18 08:47	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-09_WG_180829 **Lab ID: 50204501002** Collected: 08/29/18 14:25 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 14:26	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 14:26	74-85-1	
Methane	**11.6**	ug/L	10.0	1		08/30/18 14:26	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**6800**	ug/L	100	1	09/04/18 06:13	09/04/18 23:55	7439-89-6	
Manganese	**1780**	ug/L	10.0	1	09/04/18 06:13	09/04/18 23:55	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 09:35	7439-89-6	
Manganese, Dissolved	**1680**	ug/L	10.0	1	09/04/18 06:13	09/05/18 09:35	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**297**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	**66.0**	mg/L	20.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 12:33	09/04/18 14:20		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**30.8**	mg/L	5.0	1		08/30/18 12:48	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**4.6**	mg/L	0.10	1		08/30/18 08:50	14797-55-8	
Nitrogen, Nitrite	**0.37**	mg/L	0.10	1		08/30/18 08:50	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-09D_WG_180829 **Lab ID: 50204501003** Collected: 08/29/18 13:30 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 14:45	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 14:45	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 14:45	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**3620**	ug/L	100	1	09/04/18 06:13	09/04/18 23:57	7439-89-6	
Manganese	**418**	ug/L	10.0	1	09/04/18 06:13	09/04/18 23:57	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 09:37	7439-89-6	
Manganese, Dissolved	**197**	ug/L	10.0	1	09/04/18 06:13	09/05/18 09:37	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**391**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	**20.7**	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 12:31	09/04/18 14:16		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**24.2**	mg/L	5.0	1		08/30/18 12:53	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**0.45**	mg/L	0.10	1		08/30/18 08:51	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/30/18 08:51	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-10_WG_180829 **Lab ID: 50204501004** Collected: 08/29/18 14:15 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 15:04	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 15:04	74-85-1	
Methane	**34.1**	ug/L	10.0	1		08/30/18 15:04	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**20700**	ug/L	100	1	09/04/18 06:13	09/05/18 00:00	7439-89-6	
Manganese	**2430**	ug/L	10.0	1	09/04/18 06:13	09/05/18 00:00	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 09:53	7439-89-6	
Manganese, Dissolved	**1930**	ug/L	10.0	1	09/04/18 06:13	09/05/18 09:53	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**520**	mg/L	2.0	1		09/05/18 10:29		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	**75.7**	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 12:31	09/04/18 14:17		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**37.1**	mg/L	10.0	2		08/30/18 12:57	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**1.7**	mg/L	0.10	1		08/30/18 08:52	14797-55-8	
Nitrogen, Nitrite	**0.40**	mg/L	0.10	1		08/30/18 08:52	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-11_WG_180828 **Lab ID: 50204501005** Collected: 08/28/18 11:20 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 15:23	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 15:23	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 15:23	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**994**	ug/L	100	1	09/04/18 06:13	09/05/18 00:06	7439-89-6	
Manganese	**79.4**	ug/L	10.0	1	09/04/18 06:13	09/05/18 00:06	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 09:55	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 09:55	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**313**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	3.0	1.5	08/30/18 09:31	09/04/18 13:50		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**73.3**	mg/L	10.0	2		08/30/18 13:02	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**11.7**	mg/L	1.0	10		08/30/18 09:00	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	1.0	10		08/30/18 09:00	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-16_WG_180829 **Lab ID: 50204501006** Collected: 08/29/18 10:30 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 15:43	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 15:43	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 15:43	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**1120**	ug/L	100	1	09/04/18 06:13	09/05/18 00:08	7439-89-6	
Manganese	**136**	ug/L	10.0	1	09/04/18 06:13	09/05/18 00:08	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 09:58	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 09:58	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**378**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 12:28	09/04/18 14:10		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**13.9**	mg/L	5.0	1		08/30/18 13:10	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**2.4**	mg/L	0.10	1		08/30/18 09:01	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		08/30/18 09:01	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-17_WG_180828 **Lab ID: 50204501007** Collected: 08/28/18 12:30 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 16:31	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 16:31	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 16:31	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**351**	ug/L	100	1	09/04/18 06:13	09/05/18 00:10	7439-89-6	
Manganese	**35.2**	ug/L	10.0	1	09/04/18 06:13	09/05/18 00:10	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:00	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:00	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**312**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 11:08	09/04/18 14:03		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**25.8**	mg/L	5.0	1		08/30/18 13:12	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**6.9**	mg/L	0.50	5		08/30/18 09:02	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.50	5		08/30/18 09:02	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-19_WG_180829 **Lab ID: 50204501008** Collected: 08/29/18 12:10 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 16:50	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 16:50	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 16:50	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**791**	ug/L	100	1	09/04/18 06:13	09/05/18 00:12	7439-89-6	
Manganese	**195**	ug/L	10.0	1	09/04/18 06:13	09/05/18 00:12	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:02	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:02	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**343**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	12.0	6	08/30/18 12:30	09/04/18 14:14		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**52.1**	mg/L	10.0	2		08/30/18 13:15	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**7.3**	mg/L	0.20	2		08/30/18 09:03	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.20	2		08/30/18 09:03	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: MW-26_WG_180829 **Lab ID: 50204501009** Collected: 08/29/18 16:10 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 17:10	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 17:10	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 17:10	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**45000**	ug/L	100	1	09/04/18 06:13	09/05/18 00:14	7439-89-6	
Manganese	**423**	ug/L	10.0	1	09/04/18 06:13	09/05/18 00:14	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:05	7439-89-6	
Manganese, Dissolved	**354**	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:05	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**312**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	**46.8**	mg/L	20.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	20.0	10	08/30/18 16:41	09/04/18 17:01		B2
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**15.8**	mg/L	5.0	1		08/30/18 13:17	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, Nitrate	**9.2**	mg/L	1.0	10		08/30/18 09:04	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	1.0	10		08/30/18 09:04	14797-65-0	

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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: TB-01_WD_180829 **Lab ID: 50204501010** Collected: 08/29/18 00:00 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 01:30	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 01:30	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 01:30	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 01:30	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 01:30	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 01:30	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 01:30	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 01:30	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 01:30	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 01:30	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 01:30	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 01:30	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 01:30	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 01:30	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 01:30	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 01:30	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 01:30	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 01:30	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 01:30	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 01:30	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 01:30	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:30	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 01:30	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 01:30	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 01:30	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 01:30	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:30	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:30	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:30	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:30	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:30	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:30	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:30	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:30	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:30	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 01:30	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 01:30	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 01:30	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 01:30	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 01:30	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 01:30	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Oneals 341.104-03
Pace Project No.: 50204501

Sample: TB-01_WD_180829 **Lab ID: 50204501010** Collected: 08/29/18 00:00 Received: 08/29/18 17:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 01:30	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 01:30	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 01:30	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 01:30	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 01:30	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 01:30	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 01:30	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 01:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 01:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 01:30	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 01:30	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 01:30	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:30	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:30	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 01:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 01:30	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 01:30	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 01:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 01:30	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 01:30	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 01:30	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 01:30	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 01:30	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	107	%.	89-116	1		09/06/18 01:30	1868-53-7	
4-Bromofluorobenzene (S)	96	%.	85-111	1		09/06/18 01:30	460-00-4	
Toluene-d8 (S)	93	%.	87-110	1		09/06/18 01:30	2037-26-5	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459435 | Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified | Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2120131 Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	08/30/18 13:28	
Ethene	ug/L	ND	10.0	08/30/18 13:28	
Methane	ug/L	ND	10.0	08/30/18 13:28	

LABORATORY CONTROL SAMPLE: 2120132

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	1980	1760	89	70-130	
Ethene	ug/L	2250	2430	108	70-130	
Methane	ug/L	1980	1870	94	70-130	

SAMPLE DUPLICATE: 2120133

Parameter	Units	50204501001 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459630 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2121226 | Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	100	09/04/18 23:30	
Manganese	ug/L	ND	10.0	09/04/18 23:30	

LABORATORY CONTROL SAMPLE: 2121227

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	10100	101	80-120	
Manganese	ug/L	1000	988	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2121228 2121229

Parameter	Units	50204023004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	874	10000	10000	11300	11100	104	103	75-125	1	20	
Manganese	ug/L	65.1	1000	1000	1020	1010	96	95	75-125	1	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459743 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2121710 | Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	100	09/05/18 09:12	
Manganese, Dissolved	ug/L	ND	10.0	09/05/18 09:12	

LABORATORY CONTROL SAMPLE: 2121711

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9920	99	80-120	
Manganese, Dissolved	ug/L	1000	958	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2121712 2121713

Parameter	Units	50204501003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	ND	10000	10000	10100	10200	101	102	75-125	1	20	
Manganese, Dissolved	ug/L	197	1000	1000	1180	1180	98	99	75-125	1	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 460127 | Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 | Analysis Description: 8260 MSV
Associated Lab Samples: 50204501010

METHOD BLANK: 2123200 | Matrix: Water
Associated Lab Samples: 50204501010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	09/06/18 00:52	
1,1,1-Trichloroethane	ug/L	ND	5.0	09/06/18 00:52	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	09/06/18 00:52	
1,1,2-Trichloroethane	ug/L	ND	5.0	09/06/18 00:52	
1,1-Dichloroethane	ug/L	ND	5.0	09/06/18 00:52	
1,1-Dichloroethene	ug/L	ND	5.0	09/06/18 00:52	
1,1-Dichloropropene	ug/L	ND	5.0	09/06/18 00:52	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	09/06/18 00:52	
1,2,3-Trichloropropane	ug/L	ND	5.0	09/06/18 00:52	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	09/06/18 00:52	
1,2,4-Trimethylbenzene	ug/L	ND	5.0	09/06/18 00:52	
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	09/06/18 00:52	
1,2-Dichlorobenzene	ug/L	ND	5.0	09/06/18 00:52	
1,2-Dichloroethane	ug/L	ND	5.0	09/06/18 00:52	
1,2-Dichloropropane	ug/L	ND	5.0	09/06/18 00:52	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	09/06/18 00:52	
1,3-Dichlorobenzene	ug/L	ND	5.0	09/06/18 00:52	
1,3-Dichloropropane	ug/L	ND	5.0	09/06/18 00:52	
1,4-Dichlorobenzene	ug/L	ND	5.0	09/06/18 00:52	
1-Methylnaphthalene	ug/L	ND	10.0	09/06/18 00:52	N2
2,2-Dichloropropane	ug/L	ND	5.0	09/06/18 00:52	
2-Butanone (MEK)	ug/L	ND	25.0	09/06/18 00:52	
2-Chlorotoluene	ug/L	ND	5.0	09/06/18 00:52	
2-Hexanone	ug/L	ND	25.0	09/06/18 00:52	
2-Methylnaphthalene	ug/L	ND	10.0	09/06/18 00:52	
4-Chlorotoluene	ug/L	ND	5.0	09/06/18 00:52	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	09/06/18 00:52	
Acetone	ug/L	ND	100	09/06/18 00:52	
Acrolein	ug/L	ND	50.0	09/06/18 00:52	
Acrylonitrile	ug/L	ND	100	09/06/18 00:52	
Benzene	ug/L	ND	5.0	09/06/18 00:52	
Bromobenzene	ug/L	ND	5.0	09/06/18 00:52	
Bromochloromethane	ug/L	ND	5.0	09/06/18 00:52	
Bromodichloromethane	ug/L	ND	5.0	09/06/18 00:52	
Bromoform	ug/L	ND	5.0	09/06/18 00:52	
Bromomethane	ug/L	ND	5.0	09/06/18 00:52	
Carbon disulfide	ug/L	ND	10.0	09/06/18 00:52	
Carbon tetrachloride	ug/L	ND	5.0	09/06/18 00:52	
Chlorobenzene	ug/L	ND	5.0	09/06/18 00:52	
Chloroethane	ug/L	ND	5.0	09/06/18 00:52	
Chloroform	ug/L	ND	5.0	09/06/18 00:52	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03

Pace Project No.: 50204501

METHOD BLANK: 2123200 Matrix: Water

Associated Lab Samples: 50204501010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloromethane	ug/L	ND	5.0	09/06/18 00:52	
cis-1,2-Dichloroethene	ug/L	ND	5.0	09/06/18 00:52	
cis-1,3-Dichloropropene	ug/L	ND	5.0	09/06/18 00:52	
Dibromochloromethane	ug/L	ND	5.0	09/06/18 00:52	
Dibromomethane	ug/L	ND	5.0	09/06/18 00:52	
Dichlorodifluoromethane	ug/L	ND	5.0	09/06/18 00:52	
Ethyl methacrylate	ug/L	ND	100	09/06/18 00:52	
Ethylbenzene	ug/L	ND	5.0	09/06/18 00:52	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	09/06/18 00:52	
Iodomethane	ug/L	ND	10.0	09/06/18 00:52	
Isopropylbenzene (Cumene)	ug/L	ND	5.0	09/06/18 00:52	
Methyl-tert-butyl ether	ug/L	ND	4.0	09/06/18 00:52	
Methylene Chloride	ug/L	ND	5.0	09/06/18 00:52	
n-Butylbenzene	ug/L	ND	5.0	09/06/18 00:52	
n-Hexane	ug/L	ND	5.0	09/06/18 00:52	
n-Propylbenzene	ug/L	ND	5.0	09/06/18 00:52	
Naphthalene	ug/L	ND	1.7	09/06/18 00:52	
p-Isopropyltoluene	ug/L	ND	5.0	09/06/18 00:52	
sec-Butylbenzene	ug/L	ND	5.0	09/06/18 00:52	
Styrene	ug/L	ND	5.0	09/06/18 00:52	
tert-Butylbenzene	ug/L	ND	5.0	09/06/18 00:52	
Tetrachloroethene	ug/L	ND	5.0	09/06/18 00:52	
Toluene	ug/L	ND	5.0	09/06/18 00:52	
trans-1,2-Dichloroethene	ug/L	ND	5.0	09/06/18 00:52	
trans-1,3-Dichloropropene	ug/L	ND	5.0	09/06/18 00:52	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	09/06/18 00:52	
Trichloroethene	ug/L	ND	5.0	09/06/18 00:52	
Trichlorofluoromethane	ug/L	ND	5.0	09/06/18 00:52	
Vinyl acetate	ug/L	ND	50.0	09/06/18 00:52	
Vinyl chloride	ug/L	ND	2.0	09/06/18 00:52	
Xylene (Total)	ug/L	ND	10.0	09/06/18 00:52	
4-Bromofluorobenzene (S)	%.	98	85-111	09/06/18 00:52	
Dibromofluoromethane (S)	%.	107	89-116	09/06/18 00:52	
Toluene-d8 (S)	%.	95	87-110	09/06/18 00:52	

LABORATORY CONTROL SAMPLE: 2123201

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.9	102	80-120	
1,1,1-Trichloroethane	ug/L	50	54.6	109	74-126	
1,1,2,2-Tetrachloroethane	ug/L	50	45.5	91	73-117	
1,1,2-Trichloroethane	ug/L	50	51.1	102	74-119	
1,1-Dichloroethane	ug/L	50	51.7	103	72-119	
1,1-Dichloroethene	ug/L	50	56.8	114	72-123	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

LABORATORY CONTROL SAMPLE: 2123201

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloropropene	ug/L	50	55.0	110	77-125	
1,2,3-Trichlorobenzene	ug/L	50	46.0	92	74-125	
1,2,3-Trichloropropane	ug/L	50	49.0	98	82-121	
1,2,4-Trichlorobenzene	ug/L	50	45.3	91	70-125	
1,2,4-Trimethylbenzene	ug/L	50	49.4	99	76-118	
1,2-Dibromoethane (EDB)	ug/L	50	52.6	105	80-120	
1,2-Dichlorobenzene	ug/L	50	47.6	95	77-117	
1,2-Dichloroethane	ug/L	50	52.5	105	69-122	
1,2-Dichloropropane	ug/L	50	54.2	108	75-124	
1,3,5-Trimethylbenzene	ug/L	50	49.2	98	75-117	
1,3-Dichlorobenzene	ug/L	50	46.2	92	76-116	
1,3-Dichloropropane	ug/L	50	51.7	103	82-118	
1,4-Dichlorobenzene	ug/L	50	46.0	92	74-115	
1-Methylnaphthalene	ug/L	50	47.4	95	70-130	N2
2,2-Dichloropropane	ug/L	50	51.7	103	51-133	
2-Butanone (MEK)	ug/L	250	237	95	72-147	
2-Chlorotoluene	ug/L	50	49.9	100	73-113	
2-Hexanone	ug/L	250	239	96	71-132	
2-Methylnaphthalene	ug/L	50	45.4	91	69-123	
4-Chlorotoluene	ug/L	50	49.0	98	78-118	
4-Methyl-2-pentanone (MIBK)	ug/L	250	238	95	89-128	
Acetone	ug/L	250	234	94	46-170	
Acrolein	ug/L	1000	1210	121	13-200	
Acrylonitrile	ug/L	200	197	98	65-130	
Benzene	ug/L	50	52.2	104	78-117	
Bromobenzene	ug/L	50	49.1	98	66-126	
Bromochloromethane	ug/L	50	52.1	104	76-120	
Bromodichloromethane	ug/L	50	51.6	103	76-120	
Bromoform	ug/L	50	45.4	91	70-124	
Bromomethane	ug/L	50	65.8	132	29-181	
Carbon disulfide	ug/L	50	49.0	98	66-123	
Carbon tetrachloride	ug/L	50	54.6	109	73-132	
Chlorobenzene	ug/L	50	50.1	100	79-112	
Chloroethane	ug/L	50	59.4	119	59-156	
Chloroform	ug/L	50	50.4	101	76-118	
Chloromethane	ug/L	50	62.6	125	45-142	
cis-1,2-Dichloroethene	ug/L	50	53.4	107	75-117	
cis-1,3-Dichloropropene	ug/L	50	50.8	102	77-120	
Dibromochloromethane	ug/L	50	50.1	100	78-123	
Dibromomethane	ug/L	50	51.9	104	78-122	
Dichlorodifluoromethane	ug/L	50	51.7	103	41-168	
Ethyl methacrylate	ug/L	200	232	116	75-128	
Ethylbenzene	ug/L	50	52.2	104	80-118	
Hexachloro-1,3-butadiene	ug/L	50	47.7	95	73-125	
Iodomethane	ug/L	100	134	134	35-174	
Isopropylbenzene (Cumene)	ug/L	50	53.8	108	81-117	
Methyl-tert-butyl ether	ug/L	50	56.7	113	71-124	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

LABORATORY CONTROL SAMPLE: 2123201

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	53.9	108	59-136	
n-Butylbenzene	ug/L	50	49.2	98	72-118	
n-Hexane	ug/L	50	59.3	119	60-128	
n-Propylbenzene	ug/L	50	49.2	98	75-120	
Naphthalene	ug/L	50	46.2	92	67-126	
p-Isopropyltoluene	ug/L	50	49.8	100	75-115	
sec-Butylbenzene	ug/L	50	51.0	102	76-120	
Styrene	ug/L	50	53.8	108	74-121	
tert-Butylbenzene	ug/L	50	38.1	76	55-109	
Tetrachloroethene	ug/L	50	50.0	100	76-116	
Toluene	ug/L	50	50.6	101	77-115	
trans-1,2-Dichloroethene	ug/L	50	56.0	112	75-121	
trans-1,3-Dichloropropene	ug/L	50	49.9	100	77-121	
trans-1,4-Dichloro-2-butene	ug/L	200	198	99	42-128	
Trichloroethene	ug/L	50	51.8	104	76-120	
Trichlorofluoromethane	ug/L	50	47.2	94	81-141	
Vinyl acetate	ug/L	200	192	96	67-131	
Vinyl chloride	ug/L	50	57.3	115	64-155	
Xylene (Total)	ug/L	150	156	104	78-118	
4-Bromofluorobenzene (S)	%.			105	85-111	
Dibromofluoromethane (S)	%.			100	89-116	
Toluene-d8 (S)	%.			98	87-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2123202 2123203

Parameter	Units	50204676008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	57.4	58.4	115	117	48-138	2	20	
1,1,1-Trichloroethane	ug/L	ND	50	50	62.4	65.9	121	128	50-141	5	20	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	56.6	54.3	113	109	52-131	4	20	
1,1,2-Trichloroethane	ug/L	ND	50	50	59.7	58.1	119	116	53-131	3	20	
1,1-Dichloroethane	ug/L	ND	50	50	60.8	62.7	122	125	51-130	3	20	
1,1-Dichloroethene	ug/L	ND	50	50	63.8	67.6	128	135	51-138	6	20	
1,1-Dichloropropene	ug/L	ND	50	50	61.4	63.8	123	128	47-143	4	20	
1,2,3-Trichlorobenzene	ug/L	ND	50	50	48.7	49.0	97	98	26-143	1	20	
1,2,3-Trichloropropane	ug/L	ND	50	50	55.1	54.0	110	108	60-136	2	20	
1,2,4-Trichlorobenzene	ug/L	ND	50	50	48.7	48.5	97	97	20-142	0	20	
1,2,4-Trimethylbenzene	ug/L	ND	50	50	53.5	54.7	107	109	19-148	2	20	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	59.3	59.8	119	120	57-134	1	20	
1,2-Dichlorobenzene	ug/L	ND	50	50	52.5	52.5	105	105	30-142	0	20	
1,2-Dichloroethane	ug/L	ND	50	50	61.2	62.1	122	124	46-139	1	20	
1,2-Dichloropropane	ug/L	ND	50	50	63.7	65.8	127	132	54-135	3	20	
1,3,5-Trimethylbenzene	ug/L	ND	50	50	53.3	54.5	107	109	16-149	2	20	
1,3-Dichlorobenzene	ug/L	ND	50	50	51.2	50.1	102	100	24-142	2	20	
1,3-Dichloropropane	ug/L	ND	50	50	60.1	59.4	120	119	59-134	1	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2123202 2123203

Parameter	Units	50204676008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,4-Dichlorobenzene	ug/L	ND	50	50	49.5	49.5	99	99	24-140	0	20	
1-Methylnaphthalene	ug/L	ND	50	50	51.5	50.5	103	101	44-135	2	20	N2
2,2-Dichloropropane	ug/L	ND	50	50	59.5	63.9	119	128	24-138	7	20	
2-Butanone (MEK)	ug/L	ND	250	250	276	260	111	104	49-156	6	20	
2-Chlorotoluene	ug/L	ND	50	50	53.5	55.2	107	110	21-143	3	20	
2-Hexanone	ug/L	ND	250	250	297	275	119	110	53-140	7	20	
2-Methylnaphthalene	ug/L	ND	50	50	48.4	47.5	97	95	33-137	2	20	
4-Chlorotoluene	ug/L	ND	50	50	52.9	53.0	106	106	23-147	0	20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	250	285	270	114	108	50-139	6	20	
Acetone	ug/L	ND	250	250	292	286	117	114	34-160	2	20	
Acrolein	ug/L	ND	1000	1000	1170	1130	117	113	30-178	3	20	
Acrylonitrile	ug/L	ND	200	200	245	231	122	116	54-136	6	20	
Benzene	ug/L	ND	50	50	59.9	61.4	120	123	50-135	3	20	
Bromobenzene	ug/L	ND	50	50	58.8	58.9	118	118	28-147	0	20	
Bromochloromethane	ug/L	ND	50	50	63.4	66.4	127	133	54-138	5	20	
Bromodichloromethane	ug/L	ND	50	50	59.2	60.9	118	122	50-135	3	20	
Bromoform	ug/L	ND	50	50	49.7	49.6	99	99	43-133	0	20	
Bromomethane	ug/L	ND	50	50	68.6	79.6	137	159	15-170	15	20	
Carbon disulfide	ug/L	ND	50	50	57.4	60.8	115	122	36-139	6	20	
Carbon tetrachloride	ug/L	ND	50	50	60.3	64.7	121	129	43-151	7	20	
Chlorobenzene	ug/L	ND	50	50	54.9	55.7	110	111	39-135	1	20	
Chloroethane	ug/L	ND	50	50	72.8	78.8	146	158	42-165	8	20	
Chloroform	ug/L	ND	50	50	57.5	59.5	115	119	52-134	3	20	
Chloromethane	ug/L	ND	50	50	56.3	78.5	113	157	33-146	33	20	M1,R1
cis-1,2-Dichloroethene	ug/L	ND	50	50	60.0	61.8	120	124	48-133	3	20	
cis-1,3-Dichloropropene	ug/L	ND	50	50	55.1	56.6	110	113	46-131	3	20	
Dibromochloromethane	ug/L	ND	50	50	55.6	57.6	111	115	50-139	4	20	
Dibromomethane	ug/L	ND	50	50	58.9	60.3	118	121	55-137	2	20	
Dichlorodifluoromethane	ug/L	ND	50	50	59.2	62.5	118	125	29-178	5	20	
Ethyl methacrylate	ug/L	ND	200	200	261	256	131	128	58-136	2	20	
Ethylbenzene	ug/L	ND	50	50	57.5	58.7	115	117	31-147	2	20	
Hexachloro-1,3-butadiene	ug/L	ND	50	50	50.2	51.4	100	103	10-158	2	20	
Iodomethane	ug/L	ND	100	100	149	173	149	173	17-173	15	20	
Isopropylbenzene (Cumene)	ug/L	ND	50	50	59.9	61.6	120	123	25-151	3	20	
Methyl-tert-butyl ether	ug/L	ND	50	50	64.8	64.7	130	129	51-142	0	20	
Methylene Chloride	ug/L	ND	50	50	61.5	67.0	123	134	41-142	9	20	
n-Butylbenzene	ug/L	ND	50	50	53.3	54.3	107	109	10-153	2	20	
n-Hexane	ug/L	ND	50	50	67.4	69.5	135	139	35-141	3	20	
n-Propylbenzene	ug/L	ND	50	50	52.6	53.2	105	106	16-153	1	20	
Naphthalene	ug/L	ND	50	50	51.4	49.9	103	100	40-135	3	20	
p-Isopropyltoluene	ug/L	ND	50	50	54.7	55.0	109	110	11-150	1	20	
sec-Butylbenzene	ug/L	ND	50	50	55.0	56.2	110	112	11-157	2	20	
Styrene	ug/L	ND	50	50	59.8	60.1	120	120	28-142	0	20	
tert-Butylbenzene	ug/L	ND	50	50	40.5	41.8	81	84	11-132	3	20	
Tetrachloroethene	ug/L	ND	50	50	54.3	55.3	109	111	34-140	2	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2123202 2123203

Parameter	Units	50204676008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Toluene	ug/L	ND	50	50	55.2	55.9	110	112	43-134	1	20	
trans-1,2-Dichloroethene	ug/L	ND	50	50	62.9	63.7	126	127	51-135	1	20	
trans-1,3-Dichloropropene	ug/L	ND	50	50	56.0	57.2	112	114	44-133	2	20	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	200	247	237	123	119	12-138	4	20	
Trichloroethene	ug/L	ND	50	50	56.0	58.1	112	116	40-141	4	20	
Trichlorofluoromethane	ug/L	ND	50	50	54.7	58.4	109	117	56-162	7	20	
Vinyl acetate	ug/L	ND	200	200	173	168	86	84	11-134	3	20	
Vinyl chloride	ug/L	ND	50	50	66.2	70.2	132	140	46-164	6	20	
Xylene (Total)	ug/L	ND	150	150	171	174	114	116	29-145	2	20	
4-Bromofluorobenzene (S)	%.						109	108	85-111			
Dibromofluoromethane (S)	%.						101	102	89-116			
Toluene-d8 (S)	%.						98	98	87-110			

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459546 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2120765 Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	09/04/18 13:51	

LABORATORY CONTROL SAMPLE: 2120766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.2	96	90-110	

SAMPLE DUPLICATE: 2120767

Parameter	Units	50204501001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	280	284	2	20	

SAMPLE DUPLICATE: 2120768

Parameter	Units	50204555011 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	259	254	2	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 460013 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50204501004

METHOD BLANK: 2122762 | Matrix: Water
Associated Lab Samples: 50204501004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	09/05/18 09:36	

LABORATORY CONTROL SAMPLE: 2122763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	50.0	100	90-110	

SAMPLE DUPLICATE: 2122764

Parameter	Units	50204235007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	340	340	0	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459915 Analysis Method: EPA 410.4
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2122419 Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	10.0	09/04/18 13:21	

LABORATORY CONTROL SAMPLE: 2122420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	50	50.7	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2122421 2122422

Parameter	Units	50204501005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	ND	50	50	58.9	62.0	108	115	90-110	5	20	M0

MATRIX SPIKE SAMPLE: 2122423

Parameter	Units	50204483001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	ND	50	61.4	117	90-110	M0

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459252 — Analysis Method: SM 5210B
QC Batch Method: SM 5210B — Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008

METHOD BLANK: 2119477 — Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	09/04/18 13:42	

LABORATORY CONTROL SAMPLE: 2119479

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	216	109	85-115	

SAMPLE DUPLICATE: 2119486

Parameter	Units	50204431002 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	106	97.5	8	20	

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459460 | Analysis Method: SM 5210B
QC Batch Method: SM 5210B | Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 50204501009

METHOD BLANK: 2120347 | Matrix: Water
Associated Lab Samples: 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	09/04/18 14:41	

LABORATORY CONTROL SAMPLE: 2120349

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	212	107	85-115	

SAMPLE DUPLICATE: 2120350

Parameter	Units	50204550007 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	704	656	7	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459423 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-9002 Sulfate Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2120056 Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	08/30/18 12:30	

LABORATORY CONTROL SAMPLE: 2120057

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	21.2	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2120058 2120059

Parameter	Units	50204501001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	23.0	20	20	38.9	34.5	80	58	90-110	12	20	M3

MATRIX SPIKE SAMPLE: 2120127

Parameter	Units	50204518002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	39.0	40	68.7	74	90-110	M0

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Oneals 341.104-03
Pace Project No.: 50204501

QC Batch: 459403 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

METHOD BLANK: 2119952 Matrix: Water
Associated Lab Samples: 50204501001, 50204501002, 50204501003, 50204501004, 50204501005, 50204501006, 50204501007, 50204501008, 50204501009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	08/30/18 08:44	
Nitrogen, Nitrite	mg/L	ND	0.10	08/30/18 08:44	

LABORATORY CONTROL SAMPLE: 2119953

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1	1.1	105	90-110	
Nitrogen, Nitrite	mg/L	1	1.1	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2119954 2119955

Parameter	Units	50204501001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Nitrate	mg/L	7.6	5	5	12.6	12.7	101	102	90-110	1	20	
Nitrogen, Nitrite	mg/L	ND	5	5	5.5	5.4	108	108	90-110	0	20	

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QUALIFIERS

Project: Oneals 341.104-03
Pace Project No.: 50204501

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B2	Oxygen usage is less than 2.0 for all dilutions set. The reported value is an estimated less than value and is calculated for the dilution using the most amount of sample.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
R1	RPD value was outside control limits.

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50204501001	**MW-08_WG_180828**	RSK 175 Modified	459435		
50204501002	**MW-09_WG_180829**	RSK 175 Modified	459435		
50204501003	**MW-09D_WG_180829**	RSK 175 Modified	459435		
50204501004	**MW-10_WG_180829**	RSK 175 Modified	459435		
50204501005	**MW-11_WG_180828**	RSK 175 Modified	459435		
50204501006	**MW-16_WG_180829**	RSK 175 Modified	459435		
50204501007	**MW-17_WG_180828**	RSK 175 Modified	459435		
50204501008	**MW-19_WG_180829**	RSK 175 Modified	459435		
50204501009	**MW-26_WG_180829**	RSK 175 Modified	459435		
50204501001	**MW-08_WG_180828**	EPA 3010	459630	EPA 6010	459969
50204501002	**MW-09_WG_180829**	EPA 3010	459630	EPA 6010	459969
50204501003	**MW-09D_WG_180829**	EPA 3010	459630	EPA 6010	459969
50204501004	**MW-10_WG_180829**	EPA 3010	459630	EPA 6010	459969
50204501005	**MW-11_WG_180828**	EPA 3010	459630	EPA 6010	459969
50204501006	**MW-16_WG_180829**	EPA 3010	459630	EPA 6010	459969
50204501007	**MW-17_WG_180828**	EPA 3010	459630	EPA 6010	459969
50204501008	**MW-19_WG_180829**	EPA 3010	459630	EPA 6010	459969
50204501009	**MW-26_WG_180829**	EPA 3010	459630	EPA 6010	459969
50204501001	**MW-08_WG_180828**	EPA 3010	459743	EPA 6010	460000
50204501002	**MW-09_WG_180829**	EPA 3010	459743	EPA 6010	460000
50204501003	**MW-09D_WG_180829**	EPA 3010	459743	EPA 6010	460000
50204501004	**MW-10_WG_180829**	EPA 3010	459743	EPA 6010	460000
50204501005	**MW-11_WG_180828**	EPA 3010	459743	EPA 6010	460000
50204501006	**MW-16_WG_180829**	EPA 3010	459743	EPA 6010	460000
50204501007	**MW-17_WG_180828**	EPA 3010	459743	EPA 6010	460000
50204501008	**MW-19_WG_180829**	EPA 3010	459743	EPA 6010	460000
50204501009	**MW-26_WG_180829**	EPA 3010	459743	EPA 6010	460000
50204501010	**TB-01_WD_180829**	EPA 5030/8260	460127		
50204501001	**MW-08_WG_180828**	SM 2320B	459546		
50204501002	**MW-09_WG_180829**	SM 2320B	459546		
50204501003	**MW-09D_WG_180829**	SM 2320B	459546		
50204501004	**MW-10_WG_180829**	SM 2320B	460013		
50204501005	**MW-11_WG_180828**	SM 2320B	459546		
50204501006	**MW-16_WG_180829**	SM 2320B	459546		
50204501007	**MW-17_WG_180828**	SM 2320B	459546		
50204501008	**MW-19_WG_180829**	SM 2320B	459546		
50204501009	**MW-26_WG_180829**	SM 2320B	459546		
50204501001	**MW-08_WG_180828**	EPA 410.4	459915	EPA 410.4	459916
50204501002	**MW-09_WG_180829**	EPA 410.4	459915	EPA 410.4	459916
50204501003	**MW-09D_WG_180829**	EPA 410.4	459915	EPA 410.4	459916
50204501004	**MW-10_WG_180829**	EPA 410.4	459915	EPA 410.4	459916
50204501005	**MW-11_WG_180828**	EPA 410.4	459915	EPA 410.4	459916
50204501006	**MW-16_WG_180829**	EPA 410.4	459915	EPA 410.4	459916
50204501007	**MW-17_WG_180828**	EPA 410.4	459915	EPA 410.4	459916
50204501008	**MW-19_WG_180829**	EPA 410.4	459915	EPA 410.4	459916

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Oneals 341.104-03
Pace Project No.: 50204501

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50204501009	**MW-26_WG_180829**	EPA 410.4	459915	EPA 410.4	459916
50204501001	**MW-08_WG_180828**	SM 5210B	459252	SM 5210B	459441
50204501002	**MW-09_WG_180829**	SM 5210B	459252	SM 5210B	459441
50204501003	**MW-09D_WG_180829**	SM 5210B	459252	SM 5210B	459441
50204501004	**MW-10_WG_180829**	SM 5210B	459252	SM 5210B	459441
50204501005	**MW-11_WG_180828**	SM 5210B	459252	SM 5210B	459441
50204501006	**MW-16_WG_180829**	SM 5210B	459252	SM 5210B	459441
50204501007	**MW-17_WG_180828**	SM 5210B	459252	SM 5210B	459441
50204501008	**MW-19_WG_180829**	SM 5210B	459252	SM 5210B	459441
50204501009	**MW-26_WG_180829**	SM 5210B	459460	SM 5210B	459499
50204501001	**MW-08_WG_180828**	ASTM D516-90,02	459423		
50204501002	**MW-09_WG_180829**	ASTM D516-90,02	459423		
50204501003	**MW-09D_WG_180829**	ASTM D516-90,02	459423		
50204501004	**MW-10_WG_180829**	ASTM D516-90,02	459423		
50204501005	**MW-11_WG_180828**	ASTM D516-90,02	459423		
50204501006	**MW-16_WG_180829**	ASTM D516-90,02	459423		
50204501007	**MW-17_WG_180828**	ASTM D516-90,02	459423		
50204501008	**MW-19_WG_180829**	ASTM D516-90,02	459423		
50204501009	**MW-26_WG_180829**	ASTM D516-90,02	459423		
50204501001	**MW-08_WG_180828**	EPA 353.2	459403		
50204501002	**MW-09_WG_180829**	EPA 353.2	459403		
50204501003	**MW-09D_WG_180829**	EPA 353.2	459403		
50204501004	**MW-10_WG_180829**	EPA 353.2	459403		
50204501005	**MW-11_WG_180828**	EPA 353.2	459403		
50204501006	**MW-16_WG_180829**	EPA 353.2	459403		
50204501007	**MW-17_WG_180828**	EPA 353.2	459403		
50204501008	**MW-19_WG_180829**	EPA 353.2	459403		
50204501009	**MW-26_WG_180829**	EPA 353.2	459403		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

50204501

Page: 1 of 1

Section A Required Client Information:
- Company: Wilcox Environmental Engineering
- Address: 1552 Main Street Suite 100, Speedway, Indiana
- N/A
- Email To: jkinman@wilcoxenv.com; dataservices@wilcoxenv.com
- Phone: 317-472-0999 Fax: N/A
- Requested Due Date/TAT: Standard

Section B Required Project Information:
- Report To: jkinman@wilcoxenv.com
- Copy To: jprice@wilcoxenv.com
- N/A
- Purchase Order No.: N/A
- Project Name: O'Neal's Clothes Depot
- Project Number: 341.14

Section C Invoice Information:
- Attention: accountspayable@wilcoxenv.com
- Company Name: Wilcox Environmental Engineering
- Address: 1552 Main Street Suite 100, Speedway, Indiana
- Pace Quote Reference: N/A
- Pace Project Manager: Mark Davis
- Pace Profile #: N/A

REGULATORY AGENCY: NPDES; X GROUND WATER; DRINKING WATER; UST; RCRA; OTHER____

SITE LOCATION: GA; IL; X IN; MI; NC; OH; SC; WI; OTHER____

Section D Required Client Information

Valid Matrix Codes — MATRIX / CODE: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Filtered (Y/N): N (Dissolved Iron, Dissolved Mn)

Requested Analyses: Total Iron 6010B; Dissolved Iron 6010B; Total Mn 6010B; Dissolved Mn 6010B; Methane Ethane Ethene RSK; BOD 405.1; COD 410.1; Sulfate 9036; Nitrate 9200; Alkalinity 310.1; Hold Samp

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl (3)	NaOH	$Na_2S_2O_3$	Methanol	Other	Total Iron 6010B	Dissolved Iron 6010B	Total Mn 6010B	Dissolved Mn 6010B	Methane Ethane Ethene RSK	BOD 405.1	COD 410.1	Sulfate 9036	Nitrate 9200	Alkalinity 310.1	Hold Samp	Residual Chlorine (Y/N)	Pace Project No. Lab I.D.
1	MW-08_WG-180828	WT	G	8/28/18	1520		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			01
2	MW-09_WG-180828/9	WT	G	8/29/18	1425		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			2
3	MW-09D_WG-180829	WT	G	8/29/18	1330		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			3
4	MW-10_WG-180829	WT	G	8/29/18	1415		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			4
5	MW-11_WG-180828	WT	G	8/28/18	1120		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			5
6	MW-16_WG-180829	WT	G	8/29/18	1030		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			6
7	MW-17_WG-180828	WT	G	8/28/18	1230		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			7
8	MW-19_WG-180829	WT	G	8/29/18	1210		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			8
9	MW-26_WG-180829	WT	G	8/29/18	1610		7	X	X	X	X					X	X	X	X	X	X	X	X	X	X			9
10	TB-01_WD-180829	WT		8/29/18	0000		3				X									X						~~X~~ Samp		10
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
QAQC Level II	Jacob Price /Wilcox	8/29/18	17:58	[signature]	8-29	17:55	0.8	Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
							Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SAMPLER NAME AND SIGNATURE
- PRINT Name of SAMPLER: Jacob M. Price
- SIGNATURE of SAMPLER: Jacob M. Price
- DATE Signed (MM/DD/YY): 8/29/18

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50204501

Date/Time and Initials of person examining contents: 8/29/18 1810 HP

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No   Seals Intact: ☐ Yes ☑ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer: 1 2 3 4 5 6 A B C D E F (E circled)   Ice Type: ☑ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☑ Yes ☐ No ☐ N/A

Cooler Temperature: 1.0 / 0.8   Ice Visible in Sample Containers?: ☐ Yes ☑ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C   If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☑ N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		✓	All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (≤2, ≥9, >12) unless otherwise noted.	✓		
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓				
Chain of Custody Present:	✓		Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			
Chain of Custody Filled Out:	✓		Dissolved Metals field filtered?:		✓	
Short Hold Time Analysis (<72hr)?: Analysis:	✓		Headspace Wisconsin Sulfide			✓
Time 5035A TC placed in Freezer or Short Holds To Lab: WI				Present	Absent	N/A
			Residual Chlorine Check (SVOC 625 Pest/PCB 608)			✓
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			✓
Rush TAT Requested:		✓	Headspace in VOA Vials (>6mm): MW-11 1/3, TB-2/3	✓		
Containers Intact?:	✓		Trip Blank Present?:	✓		
Sample Labels Match COC?: Except TCs, which only require sample ID	✓		Trip Blank Custody Seals?:	✓		

Comments:

F-IN-Q-290-rev.16,5Mar2018

Sample Container Count

CLIENT: Wilcox

COC PAGE 1 of 1

COC ID#

Project # 50204501

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit SBS DI R				Matrix Sl/W/NAL (Soil/Water/Non-Aqueous Liquid)	pH <2	pH >9	pH>12
1	3											1		1	1	1					WT	✓		
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass				Plastic / Misc.			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass	BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass	BP1N	1 liter HNO_3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
DG9M	40mL MeOH clear vial	AG1S	1 liter H_2SO_4 amber glass	BP1S	1 liter H_2SO_4 plastic		
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass	BP1U	1 liter unpreserved plastic	AF	Air Filter
DG9S	40mL H_2SO_4 amber vial	AG1U	1liter unpreserved amber glass	BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO_3 amber glass	BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
DG9U	40mL unpreserved amber vial	AG2S	500mL H_2SO_4 amber glass	BP2N	500mL HNO_3 plastic	SP5T	120mL Coliform Na Thiosulfate
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass	BP2O	500mL NaOH plastic	U	Summa Can
VG9T	40mL Na Thio. clear vial	AG3S	250mL H_2SO_4 glass amber	BP2S	500mL H_2SO_4 plastic	ZPLC	Ziploc Bag
VG9U	40mL unpreserved clear vial	AG3U	250mL unpreserved amber glass	BP2U	500mL unpreserved plastic		
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass	BP2Z	500mL NaOH, Zn Ac		
VSG	Headspace septa vial & HCL	BG1S	1 liter H_2SO_4 clear glass	BP3B	250mL NaOH plastic		
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass	BP3N	250mL HNO_3 plastic		
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass	BP3S	250mL H_2SO_4 plastic		
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass				
		BG3U	250mL Unpreserved Clear Glass				

F-IN-Q-270-rev.10,31Aug2017

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

September 06, 2018

Mr. Jeremy Kinman
Wilcox Environmental Engineering
1552 Main Street
Suite 100
Indianapolis, IN 46224

RE: Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Dear Mr. Kinman:

Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mark Davis
mark.davis@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Ms. Jessica Murphy, Wilcox Environmental Engineering
Mr. Jake Price, Wilcox Environmental Engineering
Data Services, Wilcox

Pace Analytical Services, LLC
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CERTIFICATIONS

Project:	ONeals 341.14-104.03N
Pace Project No.:	50204585

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas/NELAP Certification #:E-10177
Kentucky UST Certification #: 80226
Kentucky WW Certification #:98019
Ohio VAP Certification #: CL-0065
Oklahoma Certification #: 2017-124
Texas Certification #: T104704355-18-12
West Virginia Certification #: 330
Wisconsin Certification #: 999788130
USDA Soil Permit #: P330-16-00257

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50204585001	**MW-15_WG_180830**	Water	08/30/18 11:45	08/30/18 16:30
50204585002	**MW-15D_WG_180830**	Water	08/30/18 11:00	08/30/18 16:30
50204585003	**MW-24_WG_180830**	Water	08/30/18 09:40	08/30/18 16:30
50204585004	**Dup-01_WG_180830**	Water	08/30/18 00:00	08/30/18 16:30

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Lab ID	Sample ID	Method	Analysts	Analytes Reported
50204585001	**MW-15_WG_180830**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	RNP	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204585002	**MW-15D_WG_180830**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	RNP	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204585003	**MW-24_WG_180830**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	SCM	1
		EPA 410.4	JRB	1
		SM 5210B	RNP	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2
50204585004	**Dup-01_WG_180830**	RSK 175 Modified	CWL	3
		EPA 6010	JPK	2
		EPA 6010	MJC	2
		SM 2320B	WDB	1
		EPA 410.4	JRB	1
		SM 5210B	RNP	1
		ASTM D516-90,02	MMS	1
		EPA 353.2	SLB	2

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SUMMARY OF DETECTION

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50204585001	**MW-15_WG_180830**					
EPA 6010	Iron	4180	ug/L	100	09/01/18 02:53	
EPA 6010	Manganese	166	ug/L	10.0	09/01/18 02:53	
SM 2320B	Alkalinity, Total as CaCO3	308	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	18.8	mg/L	5.0	08/31/18 14:15	
EPA 353.2	Nitrogen, NO2 plus NO3	9.4	mg/L	0.50	08/31/18 07:45	
EPA 353.2	Nitrogen, Nitrate	9.4	mg/L	0.50	08/31/18 07:45	
50204585002	**MW-15D_WG_180830**					
RSK 175 Modified	Ethene	12.6	ug/L	10.0	08/30/18 21:23	
RSK 175 Modified	Methane	10.1	ug/L	10.0	08/30/18 21:23	
EPA 6010	Iron	631	ug/L	100	09/01/18 02:55	
EPA 6010	Manganese	18.5	ug/L	10.0	09/01/18 02:55	
SM 2320B	Alkalinity, Total as CaCO3	333	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	25.6	mg/L	10.0	08/31/18 14:22	
EPA 353.2	Nitrogen, NO2 plus NO3	1.0	mg/L	0.10	08/31/18 07:44	
EPA 353.2	Nitrogen, Nitrate	0.99	mg/L	0.10	08/31/18 07:44	
50204585003	**MW-24_WG_180830**					
EPA 6010	Iron	21200	ug/L	100	09/01/18 02:57	
EPA 6010	Manganese	1120	ug/L	10.0	09/01/18 02:57	
SM 2320B	Alkalinity, Total as CaCO3	360	mg/L	2.0	09/05/18 10:52	
EPA 410.4	Chemical Oxygen Demand	76.7	mg/L	20.0	09/04/18 13:21	
ASTM D516-90,02	Sulfate	27.9	mg/L	5.0	08/31/18 14:27	
EPA 353.2	Nitrogen, NO2 plus NO3	9.5	mg/L	0.50	08/31/18 07:42	
EPA 353.2	Nitrogen, Nitrate	9.5	mg/L	0.50	08/31/18 07:42	
50204585004	**Dup-01_WG_180830**					
EPA 6010	Iron	3980	ug/L	100	09/01/18 03:00	
EPA 6010	Manganese	171	ug/L	10.0	09/01/18 03:00	
SM 2320B	Alkalinity, Total as CaCO3	308	mg/L	2.0	09/04/18 13:51	
ASTM D516-90,02	Sulfate	20.9	mg/L	5.0	08/31/18 14:36	
EPA 353.2	Nitrogen, NO2 plus NO3	9.1	mg/L	0.50	08/31/18 07:40	
EPA 353.2	Nitrogen, Nitrate	9.1	mg/L	0.50	08/31/18 07:40	

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **RSK 175 Modified**
Description: RSK 175 Headspace
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for RSK 175 Modified. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **EPA 6010**
Description: 6010 MET ICP, Lab Filtered
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **SM 2320B**
Description: 2320B Alkalinity
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for SM 2320B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **EPA 410.4**
Description: 410.4 COD
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for EPA 410.4. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 410.4 with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 459915

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50204483001,50204501005

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2122423)
  - Chemical Oxygen Demand
- MSD (Lab ID: 2122422)
  - Chemical Oxygen Demand

Additional Comments:

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PROJECT NARRATIVE

Project:	ONeals 341.14-104.03N
Pace Project No.:	50204585

Method: **SM 5210B**
Description: 5210B BOD, 5 day
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for SM 5210B. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with SM 5210B with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **ASTM D516-90,02**
Description: ASTM D516-9002 Sulfate Water
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for ASTM D516-90,02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 459583

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50204539015,50204585001

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2120877)
  - Sulfate

Additional Comments:

Analyte Comments:

QC Batch: 459583

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 2120877)
  - Sulfate

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PROJECT NARRATIVE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Method: **EPA 353.2**
Description: 353.2 Nitrogen, NO2/NO3 unpres
Client: Wilcox Environmental Engineering, Inc.
Date: September 06, 2018

General Information:
4 samples were analyzed for EPA 353.2. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 459550

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50204539019,50204585003

M0: Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

- MS (Lab ID: 2120782)
  - Nitrogen, NO2 plus NO3

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Sample: MW-15_WG_180830 **Lab ID: 50204585001** Collected: 08/30/18 11:45 Received: 08/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 21:04	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 21:04	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 21:04	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**4180**	ug/L	100	1	08/31/18 12:27	09/01/18 02:53	7439-89-6	
Manganese	**166**	ug/L	10.0	1	08/31/18 12:27	09/01/18 02:53	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:07	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:07	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**308**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/31/18 13:46	09/05/18 12:01		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**18.8**	mg/L	5.0	1		08/31/18 14:15	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**9.4**	mg/L	0.50	5		08/31/18 07:45		
Nitrogen, Nitrate	**9.4**	mg/L	0.50	5		08/31/18 07:45	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Sample: MW-15D_WG_180830 **Lab ID: 50204585002** Collected: 08/30/18 11:00 Received: 08/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 21:23	74-84-0	
Ethene	**12.6**	ug/L	10.0	1		08/30/18 21:23	74-85-1	
Methane	**10.1**	ug/L	10.0	1		08/30/18 21:23	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**631**	ug/L	100	1	08/31/18 12:27	09/01/18 02:55	7439-89-6	
Manganese	**18.5**	ug/L	10.0	1	08/31/18 12:27	09/01/18 02:55	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:09	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:09	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**333**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/31/18 13:45	09/05/18 11:59		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**25.6**	mg/L	10.0	2		08/31/18 14:22	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.0**	mg/L	0.10	1		08/31/18 07:44		
Nitrogen, Nitrate	**0.99**	mg/L	0.10	1		08/31/18 07:44	14797-55-8	

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ANALYTICAL RESULTS

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Sample: MW-24_WG_180830 **Lab ID: 50204585003** Collected: 08/30/18 09:40 Received: 08/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 21:42	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 21:42	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 21:42	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**21200**	ug/L	100	1	08/31/18 12:27	09/01/18 02:57	7439-89-6	
Manganese	**1120**	ug/L	10.0	1	08/31/18 12:27	09/01/18 02:57	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:18	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:18	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**360**	mg/L	2.0	1		09/05/18 10:52		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	**76.7**	mg/L	20.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/31/18 13:44	09/05/18 11:54		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**27.9**	mg/L	5.0	1		08/31/18 14:27	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**9.5**	mg/L	0.50	5		08/31/18 07:42		
Nitrogen, Nitrate	**9.5**	mg/L	0.50	5		08/31/18 07:42	14797-55-8	

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ANALYTICAL RESULTS

Project: ONeals 341.14-104.03N

Pace Project No.: 50204585

Sample: Dup-01_WG_180830 **Lab ID: 50204585004** Collected: 08/30/18 00:00 Received: 08/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		08/30/18 22:01	74-84-0	
Ethene	ND	ug/L	10.0	1		08/30/18 22:01	74-85-1	
Methane	ND	ug/L	10.0	1		08/30/18 22:01	74-82-8	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron	**3980**	ug/L	100	1	08/31/18 12:27	09/01/18 03:00	7439-89-6	
Manganese	**171**	ug/L	10.0	1	08/31/18 12:27	09/01/18 03:00	7439-96-5	
6010 MET ICP, Lab Filtered	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	100	1	09/04/18 06:13	09/05/18 10:21	7439-89-6	
Manganese, Dissolved	ND	ug/L	10.0	1	09/04/18 06:13	09/05/18 10:21	7439-96-5	
2320B Alkalinity	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**308**	mg/L	2.0	1		09/04/18 13:51		
410.4 COD	Analytical Method: EPA 410.4 Preparation Method: EPA 410.4							
Chemical Oxygen Demand	ND	mg/L	10.0	1	09/04/18 10:24	09/04/18 13:21		
5210B BOD, 5 day	Analytical Method: SM 5210B Preparation Method: SM 5210B							
BOD, 5 day	ND	mg/L	2.0	1	08/31/18 13:42	09/05/18 11:50		
ASTM D516-9002 Sulfate Water	Analytical Method: ASTM D516-90,02							
Sulfate	**20.9**	mg/L	5.0	1		08/31/18 14:36	14808-79-8	
353.2 Nitrogen, NO2/NO3 unpres	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**9.1**	mg/L	0.50	5		08/31/18 07:40		
Nitrogen, Nitrate	**9.1**	mg/L	0.50	5		08/31/18 07:40	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459498
Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified
Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2120532
Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	08/30/18 20:44	
Ethene	ug/L	ND	10.0	08/30/18 20:44	
Methane	ug/L	ND	10.0	08/30/18 20:44	

LABORATORY CONTROL SAMPLE: 2120533

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	1980	2220	112	70-130	
Ethene	ug/L	2250	2400	107	70-130	
Methane	ug/L	1980	1780	90	70-130	

SAMPLE DUPLICATE: 2120534

Parameter	Units	50204539017 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	78.1	75.7	3	20	
Methane	ug/L	4460	4550	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459514 — Analysis Method: EPA 6010
QC Batch Method: EPA 3010 — Analysis Description: 6010 MET
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2120649 — Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	ug/L	ND	100	09/01/18 02:00	
Manganese	ug/L	ND	10.0	09/01/18 02:00	

LABORATORY CONTROL SAMPLE: 2120650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	10000	9340	93	80-120	
Manganese	ug/L	1000	919	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2120651 2120652

Parameter	Units	50204551005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	20500	10000	10000	31600	32200	111	116	75-125	2	20	
Manganese	ug/L	213	1000	1000	1130	1140	92	93	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459743 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2121710 Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	100	09/05/18 09:12	
Manganese, Dissolved	ug/L	ND	10.0	09/05/18 09:12	

LABORATORY CONTROL SAMPLE: 2121711

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9920	99	80-120	
Manganese, Dissolved	ug/L	1000	958	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2121712 2121713

Parameter	Units	50204501003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	ND	10000	10000	10100	10200	101	102	75-125	1	20	
Manganese, Dissolved	ug/L	197	1000	1000	1180	1180	98	99	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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(317)228-3100

QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459546 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50204585001, 50204585002, 50204585004

METHOD BLANK: 2120765 Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	09/04/18 13:51	

LABORATORY CONTROL SAMPLE: 2120766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.2	96	90-110	

SAMPLE DUPLICATE: 2120767

Parameter	Units	50204501001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	280	284	2	20	

SAMPLE DUPLICATE: 2120768

Parameter	Units	50204555011 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	259	254	2	20	

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 460013 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 50204585003

METHOD BLANK: 2122762 Matrix: Water
Associated Lab Samples: 50204585003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	2.0	09/05/18 09:36	

LABORATORY CONTROL SAMPLE: 2122763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	50.0	100	90-110	

SAMPLE DUPLICATE: 2122764

Parameter	Units	50204235007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	340	340	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459915 Analysis Method: EPA 410.4
QC Batch Method: EPA 410.4 Analysis Description: 410.4 COD
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2122419 Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	10.0	09/14/18 13:21	

LABORATORY CONTROL SAMPLE: 2122420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	50	50.7	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2122421 2122422

Parameter	Units	50204501005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chemical Oxygen Demand	mg/L	ND	50	50	58.9	62.0	108	115	90-110	5	20	M0

MATRIX SPIKE SAMPLE: 2122423

Parameter	Units	50204483001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	ND	50	61.4	117	90-110	M0

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459612 Analysis Method: SM 5210B
QC Batch Method: SM 5210B Analysis Description: 5210B BOD, 5 day
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2121081 Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
BOD, 5 day	mg/L	ND	2.0	09/05/18 11:46	

LABORATORY CONTROL SAMPLE: 2121083

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
BOD, 5 day	mg/L	198	224	113	85-115	

SAMPLE DUPLICATE: 2121084

Parameter	Units	50204540002 Result	Dup Result	RPD	Max RPD	Qualifiers
BOD, 5 day	mg/L	20.3	20.8	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459583 Analysis Method: ASTM D516-90,02
QC Batch Method: ASTM D516-90,02 Analysis Description: ASTM D516-9002 Sulfate Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2120875 Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	5.0	08/31/18 14:10	

LABORATORY CONTROL SAMPLE: 2120876

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	21.2	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2120877 2120878

Parameter	Units	50204585001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	18.8	20	20	41.0	39.6	111	104	90-110	4	20	E,M0

MATRIX SPIKE SAMPLE: 2120879

Parameter	Units	50204539015 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	194	250	454	104	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

QC Batch: 459550 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, Unpres.
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

METHOD BLANK: 2120778 Matrix: Water
Associated Lab Samples: 50204585001, 50204585002, 50204585003, 50204585004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	08/31/18 07:04	
Nitrogen, NO2 plus NO3	mg/L	ND	0.10	08/31/18 07:04	

LABORATORY CONTROL SAMPLE: 2120779

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1	0.95	95	90-110	
Nitrogen, NO2 plus NO3	mg/L	2	2.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2120780 2120781

Parameter	Units	50204539019 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Nitrate	mg/L	ND	1	1	1.1	1.0	104	102	90-110	2	20	
Nitrogen, NO2 plus NO3	mg/L	ND	2	2	2.2	2.2	109	107	90-110	1	20	

MATRIX SPIKE SAMPLE: 2120782

Parameter	Units	50204585003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	9.5	5	14.0	89	90-110	
Nitrogen, NO2 plus NO3	mg/L	9.5	10	19.6	101	90-110	M0

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QUALIFIERS

Project:	ONeals 341.14-104.03N
Pace Project No.:	50204585

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: ONeals 341.14-104.03N
Pace Project No.: 50204585

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50204585001	MW-15_WG_180830	RSK 175 Modified	459498		
50204585002	MW-15D_WG_180830	RSK 175 Modified	459498		
50204585003	MW-24_WG_180830	RSK 175 Modified	459498		
50204585004	Dup-01_WG_180830	RSK 175 Modified	459498		
50204585001	MW-15_WG_180830	EPA 3010	459514	EPA 6010	459739
50204585002	MW-15D_WG_180830	EPA 3010	459514	EPA 6010	459739
50204585003	MW-24_WG_180830	EPA 3010	459514	EPA 6010	459739
50204585004	Dup-01_WG_180830	EPA 3010	459514	EPA 6010	459739
50204585001	MW-15_WG_180830	EPA 3010	459743	EPA 6010	460000
50204585002	MW-15D_WG_180830	EPA 3010	459743	EPA 6010	460000
50204585003	MW-24_WG_180830	EPA 3010	459743	EPA 6010	460000
50204585004	Dup-01_WG_180830	EPA 3010	459743	EPA 6010	460000
50204585001	MW-15_WG_180830	SM 2320B	459546		
50204585002	MW-15D_WG_180830	SM 2320B	459546		
50204585003	MW-24_WG_180830	SM 2320B	460013		
50204585004	Dup-01_WG_180830	SM 2320B	459546		
50204585001	MW-15_WG_180830	EPA 410.4	459915	EPA 410.4	459916
50204585002	MW-15D_WG_180830	EPA 410.4	459915	EPA 410.4	459916
50204585003	MW-24_WG_180830	EPA 410.4	459915	EPA 410.4	459916
50204585004	Dup-01_WG_180830	EPA 410.4	459915	EPA 410.4	459916
50204585001	MW-15_WG_180830	SM 5210B	459612	SM 5210B	459656
50204585002	MW-15D_WG_180830	SM 5210B	459612	SM 5210B	459656
50204585003	MW-24_WG_180830	SM 5210B	459612	SM 5210B	459656
50204585004	Dup-01_WG_180830	SM 5210B	459612	SM 5210B	459656
50204585001	MW-15_WG_180830	ASTM D516-90,02	459583		
50204585002	MW-15D_WG_180830	ASTM D516-90,02	459583		
50204585003	MW-24_WG_180830	ASTM D516-90,02	459583		
50204585004	Dup-01_WG_180830	ASTM D516-90,02	459583		
50204585001	MW-15_WG_180830	EPA 353.2	459550		
50204585002	MW-15D_WG_180830	EPA 353.2	459550		
50204585003	MW-24_WG_180830	EPA 353.2	459550		
50204585004	Dup-01_WG_180830	EPA 353.2	459550		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:
- Company: Wilcox Environmental Engineering
- Address: 1552 Main Street Suite 100, Speedway, Indiana
- N/A
- Email To: jkinman@wilcoxenv.com; dataservices@wilcoxenv.com
- Phone: 317-472-0999 Fax: N/A
- Requested Due Date/TAT: Standard

Section B Required Project Information:
- Report To: jkinman@wilcoxenv.com
- Copy To: jprice@wilcoxenv.com
- N/A
- Purchase Order No.: N/A
- Project Name: O'Neal's Clothes Depot
- Project Number: 341.14-104.3 N

Section C Invoice Information:
- Attention: accountspayable@wilcoxenv.com
- Company Name: Wilcox Environmental Engineering
- Address: 1552 Main Street Suite 100, Speedway, Indiana
- Pace Quote Reference: N/A
- Pace Project Manager: Mark Davis
- Pace Profile #: N/A

REGULATORY AGENCY
- NPDES X GROUND WATER DRINKING WATER
- UST RCRA OTHER
- SITE LOCATION: GA IL X IN MI NC OH SC WI OTHER

Section D Required Client Information

Valid Matrix Codes: DRINKING WATER DW, WATER WT, WASTEWATER WW, PRODUCT P, SOIL/SOLID SL, OIL OL, WP, AR, OT, TS

Filtered (Y/N): N N

Requested Analysis: Total Iron 6010B; Dissolved Iron 6010B; Total Mn 6010B; Dissolved Mn 6010B; Methane/Ethane/Ethene; BOD 405.1; COD 410.1; Sulfate 9038; Nitrate 9200; Alkalinity 310.1

Pace Project No./Lab I.D.: 50204565

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE	DATE	TIME	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	Requested Analysis	Lab I.D.
1	MW-15_WG_180830	WT	G	8/30/18	1145	8	3	1	1	3	X X X X X X X X X	001
2	MW-15D_WG_180830	WT	G	8/30/18	1100	8	3	1	1	3	X X X X X X X X X	002
3	MW-24_WG_180830	WT	G	8/30/18	0940	8	3	1	1	3	X X X X X X X X X	003
4	Dup-01_WG_180830	WT	G	8/30/18	0000	8	3	1	1	3	X X X X X X X X X	004
5												
6												
7												
8												
9												
10												
11												
12												

ITEM #	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
QAQC Level II	Jacob M. Price /Wilcox	8/30/18	1630	[signature]	8-30-18	1630	3.1	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE
- PRINT Name of SAMPLER: Jacob M. Price
- SIGNATURE of SAMPLER: Jacob M. Price
- DATE Signed (MM/DD/YY): 8/30/18

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 50204585

Date/Time and Initials of person examining contents: 8/30/18 1640 HP

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ Other ______

Tracking #: ______

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No **Seals Intact:** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other ______

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: ☒ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☐ No ☒ N/A

Cooler Temperature: 2.8 / 3.1 Ice Visible in Sample Containers?: ☐ Yes ☒ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☒ N/A

All discrepancies will be written out in the comments section below.

	Yes	No
Are samples from West Virginia? Document any containers out of temp.		✓
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓
Chain of Custody Present:	✓	
Chain of Custody Filled Out:	✓	
Short Hold Time Analysis (<72hr)?: Analysis: BOD nitrate	X	
Time 5035A TC placed in Freezer or Short Holds To Lab: 1700		
Rush TAT Requested:		✓
Containers Intact?:	✓	
Sample Labels Match COC?: Except TCs, which only require sample ID	✓	

	Yes	No	N/A
All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted. Circle: HNO3 H2SO4 NaOH NaOH/ZnAc	✓		
Dissolved Metals field filtered?:		✓	
Headspace Wisconsin Sulfide			✓
	Present	Absent	N/A
Residual Chlorine Check (SVOC 625 Pest/PCB 608)			✓
Residual Chlorine Check (Total/Amenable/Free Cyanide)			✓
Headspace in VOA Vials (>6mm):		✓	
Trip Blank Present?:		✓	
Trip Blank Custody Seals?:		✓	

Comments:

Mark said line is set up for this HP 8/30/18

Sample Container Count

WO#: 50204585
50204585

CLIENT: Wilcox

COC PAGE 1 of 1
COC ID# ______

Project # 50204585

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bu Kit R				Matrix S (Soil/Wa Aqueous	pH <2	pH >9	pH>12
1	3											1		1	1	2					WT	✓		
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

F-IN-Q-270-rev.10,31Aug2017

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

September 10, 2018

Mr. Jeremy Kinman
Wilcox Environmental Engineering
1552 Main Street
Suite 100
Indianapolis, IN 46224

RE: Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Dear Mr. Kinman:

Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Mark E. Davis

Mark Davis
mark.davis@pacelabs.com
(317)228-3100
Project Manager

Enclosures

cc: Ms. Jessica Murphy, Wilcox Environmental Engineering
Mr. Jake Price, Wilcox Environmental Engineering
Data Services, Wilcox

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project:	O'Neal's Clothes Depot
Pace Project No.:	50204603

Indiana Certification IDs

7726 Moller Road, Indianapolis, IN 46268
Illinois Certification #: 200074
Indiana Certification #: C-49-06
Kansas/NELAP Certification #:E-10177
Kentucky UST Certification #: 80226
Kentucky WW Certification #:98019
Ohio VAP Certification #: CL-0065
Oklahoma Certification #: 2017-124
Texas Certification #: T104704355-18-12
West Virginia Certification #: 330
Wisconsin Certification #: 999788130
USDA Soil Permit #: P330-16-00257

Pace Analytical Services, LLC
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(317)228-3100

SAMPLE SUMMARY

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50204603001	**MW-02_WG_180827**	Water	08/27/18 11:35	08/30/18 17:25
50204603002	**MW-03_WG_180828**	Water	08/28/18 10:32	08/30/18 17:25
50204603003	**MW-05_WG_180828**	Water	08/28/18 09:43	08/30/18 17:25
50204603004	**MW-07_WG_180828**	Water	08/28/18 11:17	08/30/18 17:25
50204603005	**MW-11_WG_180828**	Water	08/28/18 11:20	08/30/18 17:25
50204603006	**MW-12_WG_180828**	Water	08/28/18 12:12	08/30/18 17:25
50204603007	**MW-21_WG_180828**	Water	08/28/18 13:13	08/30/18 17:25
50204603008	**MW-23_WG_180828**	Water	08/28/18 14:06	08/30/18 17:25
50204603009	**MW-25_WG_180828**	Water	08/28/18 15:02	08/30/18 17:25
50204603010	**MW-27_WG_180829**	Water	08/29/18 10:22	08/30/18 17:25
50204603011	**MW-28_WG_180829**	Water	08/29/18 11:27	08/30/18 17:25
50204603012	**MW-29_WG_180829**	Water	08/29/18 12:27	08/30/18 17:25
50204603013	**MW-04_WG_180829**	Water	08/29/18 13:22	08/30/18 17:25
50204603014	**MW-01_WG_180829**	Water	08/29/18 14:10	08/30/18 17:25
50204603015	**MW-14_WG_180829**	Water	08/29/18 15:01	08/30/18 17:25
50204603016	**MW-17_WG_180828**	Water	08/28/18 12:30	08/30/18 17:25
50204603017	**MW-13_WG_180829**	Water	08/29/18 15:45	08/30/18 17:25
50204603018	**MW-10_WG_180828**	Water	08/28/18 14:15	08/30/18 17:25
50204603019	**MW-08_WG_180828**	Water	08/28/18 15:20	08/30/18 17:25
50204603020	**MW-16_WG_180829**	Water	08/29/18 10:30	08/30/18 17:25
50204603021	**MW-18_WG_180830**	Water	08/30/18 09:22	08/30/18 17:25
50204603022	**MW-20_WG_180830**	Water	08/30/18 10:16	08/30/18 17:25
50204603023	**MW-06_WG_180830**	Water	08/30/18 11:10	08/30/18 17:25
50204603024	**MW-19_WG_180829**	Water	08/29/18 12:10	08/30/18 17:25
50204603025	**MW-9D_WG_180829**	Water	08/29/18 13:30	08/30/18 17:25
50204603026	**MW-09_WG_180829**	Water	08/29/18 14:25	08/30/18 17:25
50204603027	**MW-26_WG_180829**	Water	08/29/18 16:10	08/30/18 17:25
50204603028	**MW-22_WG_180830**	Water	08/30/18 11:58	08/30/18 17:25
50204603029	**MW-24_WG_180830**	Water	08/30/18 09:40	08/30/18 17:25
50204603030	**MW-15D_WG_180830**	Water	08/30/18 11:00	08/30/18 17:25
50204603031	**MW-15_WG_180830**	Water	08/30/18 11:45	08/30/18 17:25
50204603032	**DUP-01_WG_180830**	Water	08/30/18 00:00	08/30/18 17:25
50204603033	**DUP-02_WG_180830**	Water	08/30/18 00:00	08/30/18 17:25
50204603034	**EQB-1_WD_180830**	Water	08/30/18 11:20	08/30/18 17:25
50204603035	**EQB-2_WD_180830**	Water	08/30/18 11:10	08/30/18 17:25
50204603036	**TB-01_WD_180827**	Water	08/27/18 00:00	08/30/18 17:25

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SAMPLE ANALYTE COUNT

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Lab ID	Sample ID	Method	Analysts	Analytes Reported
50204603001	**MW-02_WG_180827**	EPA 5030/8260	AMV	75
50204603002	**MW-03_WG_180828**	EPA 5030/8260	AMV	75
50204603003	**MW-05_WG_180828**	EPA 5030/8260	AMV	75
50204603004	**MW-07_WG_180828**	EPA 5030/8260	AMV	75
50204603005	**MW-11_WG_180828**	EPA 5030/8260	AMV	75
50204603006	**MW-12_WG_180828**	EPA 5030/8260	AMV	75
50204603007	**MW-21_WG_180828**	EPA 5030/8260	AMV	75
50204603008	**MW-23_WG_180828**	EPA 5030/8260	AMV	75
50204603009	**MW-25_WG_180828**	EPA 5030/8260	AMV	75
50204603010	**MW-27_WG_180829**	EPA 5030/8260	AMV	75
50204603011	**MW-28_WG_180829**	EPA 5030/8260	AMV	75
50204603012	**MW-29_WG_180829**	EPA 5030/8260	AMV	75
50204603013	**MW-04_WG_180829**	EPA 5030/8260	AMV	75
50204603014	**MW-01_WG_180829**	EPA 5030/8260	AMV	75
50204603015	**MW-14_WG_180829**	EPA 5030/8260	AMV	75
50204603016	**MW-17_WG_180828**	EPA 5030/8260	AMV	75
50204603017	**MW-13_WG_180829**	EPA 5030/8260	AMV	75
50204603018	**MW-10_WG_180828**	EPA 5030/8260	AMV	75
50204603019	**MW-08_WG_180828**	EPA 5030/8260	AMV	75
50204603020	**MW-16_WG_180829**	EPA 5030/8260	AMV	75
50204603021	**MW-18_WG_180830**	EPA 5030/8260	AMV	75
50204603022	**MW-20_WG_180830**	EPA 5030/8260	AMV	75
50204603023	**MW-06_WG_180830**	EPA 5030/8260	AMV	75
50204603024	**MW-19_WG_180829**	EPA 5030/8260	AMV	75
50204603025	**MW-9D_WG_180829**	EPA 5030/8260	AMV	75
50204603026	**MW-09_WG_180829**	EPA 5030/8260	AMV	75
50204603027	**MW-26_WG_180829**	EPA 5030/8260	AMV	75
50204603028	**MW-22_WG_180830**	EPA 5030/8260	AMV	75
50204603029	**MW-24_WG_180830**	EPA 5030/8260	AMV	75
50204603030	**MW-15D_WG_180830**	EPA 5030/8260	AMV	75
50204603031	**MW-15_WG_180830**	EPA 5030/8260	AMV	75
50204603032	**DUP-01_WG_180830**	EPA 5030/8260	AMV	75
50204603033	**DUP-02_WG_180830**	EPA 5030/8260	AMV	75
50204603034	**EQB-1_WD_180830**	EPA 5030/8260	AMV	75
50204603035	**EQB-2_WD_180830**	EPA 5030/8260	AMV	75
50204603036	**TB-01_WD_180827**	EPA 5030/8260	AMV	75

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50204603004	**MW-07_WG_180828**					
EPA 5030/8260	Tetrachloroethene	14.3	ug/L	5.0	09/05/18 19:29	
50204603006	**MW-12_WG_180828**					
EPA 5030/8260	Tetrachloroethene	15.8	ug/L	5.0	09/05/18 20:18	
50204603011	**MW-28_WG_180829**					
EPA 5030/8260	Tetrachloroethene	17.8	ug/L	5.0	09/06/18 00:47	
50204603013	**MW-04_WG_180829**					
EPA 5030/8260	Tetrachloroethene	5.7	ug/L	5.0	09/06/18 01:36	
50204603014	**MW-01_WG_180829**					
EPA 5030/8260	Tetrachloroethene	37.4	ug/L	5.0	09/06/18 02:00	
50204603015	**MW-14_WG_180829**					
EPA 5030/8260	Tetrachloroethene	14.4	ug/L	5.0	09/06/18 02:24	
50204603016	**MW-17_WG_180828**					
EPA 5030/8260	Tetrachloroethene	26.3	ug/L	5.0	09/06/18 02:49	
50204603017	**MW-13_WG_180829**					
EPA 5030/8260	Tetrachloroethene	21.8	ug/L	5.0	09/06/18 03:13	
50204603019	**MW-08_WG_180828**					
EPA 5030/8260	Tetrachloroethene	84.6	ug/L	5.0	09/06/18 04:02	
50204603020	**MW-16_WG_180829**					
EPA 5030/8260	Tetrachloroethene	20.3	ug/L	5.0	09/06/18 04:27	
50204603021	**MW-18_WG_180830**					
EPA 5030/8260	Tetrachloroethene	20.0	ug/L	5.0	09/06/18 04:51	
50204603022	**MW-20_WG_180830**					
EPA 5030/8260	Tetrachloroethene	12.8	ug/L	5.0	09/06/18 05:15	
50204603023	**MW-06_WG_180830**					
EPA 5030/8260	Tetrachloroethene	100	ug/L	5.0	09/06/18 05:40	
50204603024	**MW-19_WG_180829**					
EPA 5030/8260	Tetrachloroethene	67.8	ug/L	5.0	09/06/18 06:04	
50204603025	**MW-9D_WG_180829**					
EPA 5030/8260	Tetrachloroethene	10.6	ug/L	5.0	09/06/18 06:29	
50204603027	**MW-26_WG_180829**					
EPA 5030/8260	Tetrachloroethene	154	ug/L	5.0	09/06/18 07:18	
50204603028	**MW-22_WG_180830**					
EPA 5030/8260	Tetrachloroethene	97.9	ug/L	5.0	09/06/18 07:42	
50204603029	**MW-24_WG_180830**					
EPA 5030/8260	Tetrachloroethene	108	ug/L	5.0	09/06/18 20:20	M5

REPORT OF LABORATORY ANALYSIS

SUMMARY OF DETECTION

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50204603031	**MW-15_WG_180830**					
EPA 5030/8260	Tetrachloroethene	128	ug/L	5.0	09/06/18 17:05	M5
50204603032	**DUP-01_WG_180830**					
EPA 5030/8260	Tetrachloroethene	208	ug/L	5.0	09/06/18 17:29	M5
50204603033	**DUP-02_WG_180830**					
EPA 5030/8260	Tetrachloroethene	132	ug/L	5.0	09/06/18 17:54	M5

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 10, 2018

General Information:
36 samples were analyzed for EPA 5030/8260. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 460612

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: 460081

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2123026)
    - 1-Methylnaphthalene
- DUP (Lab ID: 2123029)
    - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 10, 2018

Analyte Comments:

QC Batch: 460081

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- LCS (Lab ID: 2123027)
  - 1-Methylnaphthalene
- MS (Lab ID: 2123028)
  - 1-Methylnaphthalene
- MW-02_WG_180827 (Lab ID: 50204603001)
  - 1-Methylnaphthalene
- MW-03_WG_180828 (Lab ID: 50204603002)
  - 1-Methylnaphthalene
- MW-05_WG_180828 (Lab ID: 50204603003)
  - 1-Methylnaphthalene
- MW-07_WG_180828 (Lab ID: 50204603004)
  - 1-Methylnaphthalene
- MW-11_WG_180828 (Lab ID: 50204603005)
  - 1-Methylnaphthalene
- MW-12_WG_180828 (Lab ID: 50204603006)
  - 1-Methylnaphthalene
- MW-21_WG_180828 (Lab ID: 50204603007)
  - 1-Methylnaphthalene
- MW-23_WG_180828 (Lab ID: 50204603008)
  - 1-Methylnaphthalene

QC Batch: 460082

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2123030)
  - 1-Methylnaphthalene
- DUP (Lab ID: 2123033)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2123031)
  - 1-Methylnaphthalene
- MS (Lab ID: 2123032)
  - 1-Methylnaphthalene
- MW-01_WG_180829 (Lab ID: 50204603014)
  - 1-Methylnaphthalene
- MW-04_WG_180829 (Lab ID: 50204603013)
  - 1-Methylnaphthalene
- MW-06_WG_180830 (Lab ID: 50204603023)
  - 1-Methylnaphthalene
- MW-08_WG_180828 (Lab ID: 50204603019)
  - 1-Methylnaphthalene
- MW-09_WG_180829 (Lab ID: 50204603026)
  - 1-Methylnaphthalene
- MW-10_WG_180828 (Lab ID: 50204603018)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 10, 2018

Analyte Comments:

QC Batch: 460082

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- MW-13_WG_180829 (Lab ID: 50204603017)
  - 1-Methylnaphthalene
- MW-14_WG_180829 (Lab ID: 50204603015)
  - 1-Methylnaphthalene
- MW-16_WG_180829 (Lab ID: 50204603020)
  - 1-Methylnaphthalene
- MW-17_WG_180828 (Lab ID: 50204603016)
  - 1-Methylnaphthalene
- MW-18_WG_180830 (Lab ID: 50204603021)
  - 1-Methylnaphthalene
- MW-19_WG_180829 (Lab ID: 50204603024)
  - 1-Methylnaphthalene
- MW-20_WG_180830 (Lab ID: 50204603022)
  - 1-Methylnaphthalene
- MW-22_WG_180830 (Lab ID: 50204603028)
  - 1-Methylnaphthalene
- MW-25_WG_180828 (Lab ID: 50204603009)
  - 1-Methylnaphthalene
- MW-26_WG_180829 (Lab ID: 50204603027)
  - 1-Methylnaphthalene
- MW-27_WG_180829 (Lab ID: 50204603010)
  - 1-Methylnaphthalene
- MW-28_WG_180829 (Lab ID: 50204603011)
  - 1-Methylnaphthalene
- MW-29_WG_180829 (Lab ID: 50204603012)
  - 1-Methylnaphthalene
- MW-9D_WG_180829 (Lab ID: 50204603025)
  - 1-Methylnaphthalene

QC Batch: 460612

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- BLANK (Lab ID: 2125809)
  - 1-Methylnaphthalene
- DUP-01_WG_180830 (Lab ID: 50204603032)
  - 1-Methylnaphthalene
- DUP-02_WG_180830 (Lab ID: 50204603033)
  - 1-Methylnaphthalene
- EQB-1_WD_180830 (Lab ID: 50204603034)
  - 1-Methylnaphthalene
- EQB-2_WD_180830 (Lab ID: 50204603035)
  - 1-Methylnaphthalene
- LCS (Lab ID: 2125810)
  - 1-Methylnaphthalene

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PROJECT NARRATIVE

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Method: **EPA 5030/8260**
Description: 8260 MSV Indiana
Client: Wilcox Environmental Engineering, Inc.
Date: September 10, 2018

Analyte Comments:

QC Batch: 460612

N2: The lab does not hold NELAC/TNI accreditation for this parameter.

- MW-15D_WG_180830 (Lab ID: 50204603030)
  - 1-Methylnaphthalene
- MW-15_WG_180830 (Lab ID: 50204603031)
  - 1-Methylnaphthalene
- MW-24_WG_180830 (Lab ID: 50204603029)
  - 1-Methylnaphthalene
- TB-01_WD_180827 (Lab ID: 50204603036)
  - 1-Methylnaphthalene

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-02_WG_180827 **Lab ID: 50204603001** Collected: 08/27/18 11:35 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 18:16	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 18:16	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 18:16	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 18:16	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 18:16	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 18:16	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 18:16	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 18:16	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 18:16	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 18:16	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 18:16	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 18:16	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 18:16	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 18:16	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 18:16	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 18:16	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 18:16	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 18:16	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 18:16	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 18:16	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 18:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:16	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:16	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:16	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 18:16	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 18:16	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 18:16	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 18:16	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 18:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 18:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 18:16	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 18:16	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 18:16	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 18:16	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 18:16	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 18:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 18:16	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 18:16	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 18:16	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 18:16	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 18:16	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 18:16	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 18:16	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-02_WG_180827 **Lab ID: 50204603001** Collected: 08/27/18 11:35 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 18:16	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 18:16	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 18:16	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 18:16	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 18:16	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 18:16	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 18:16	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 18:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 18:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 18:16	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 18:16	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 18:16	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:16	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:16	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 18:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 18:16	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 18:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 18:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 18:16	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 18:16	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 18:16	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 18:16	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 18:16	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/05/18 18:16	1868-53-7	
4-Bromofluorobenzene (S)	102	%.	85-111	1		09/05/18 18:16	460-00-4	
Toluene-d8 (S)	104	%.	87-110	1		09/05/18 18:16	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-03_WG_180828 **Lab ID: 50204603002** Collected: 08/28/18 10:32 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 18:40	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 18:40	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 18:40	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 18:40	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 18:40	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 18:40	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 18:40	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 18:40	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 18:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 18:40	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 18:40	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 18:40	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 18:40	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 18:40	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 18:40	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 18:40	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 18:40	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 18:40	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 18:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 18:40	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 18:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 18:40	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 18:40	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 18:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 18:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 18:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 18:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 18:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 18:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 18:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 18:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 18:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 18:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 18:40	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 18:40	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 18:40	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 18:40	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 18:40	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 18:40	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 18:40	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-03_WG_180828 **Lab ID: 50204603002** Collected: 08/28/18 10:32 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 18:40	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 18:40	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 18:40	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 18:40	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 18:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 18:40	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 18:40	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 18:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 18:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 18:40	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 18:40	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 18:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 18:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 18:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 18:40	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 18:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 18:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 18:40	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 18:40	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 18:40	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 18:40	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 18:40	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	94	%.	89-116	1		09/05/18 18:40	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	85-111	1		09/05/18 18:40	460-00-4	
Toluene-d8 (S)	100	%.	87-110	1		09/05/18 18:40	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-05_WG_180828 **Lab ID: 50204603003** Collected: 08/28/18 09:43 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 19:05	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 19:05	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 19:05	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 19:05	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 19:05	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 19:05	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 19:05	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 19:05	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 19:05	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 19:05	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 19:05	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 19:05	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 19:05	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 19:05	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 19:05	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 19:05	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 19:05	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 19:05	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 19:05	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 19:05	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 19:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:05	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:05	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:05	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 19:05	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 19:05	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 19:05	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 19:05	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:05	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:05	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:05	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:05	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:05	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:05	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 19:05	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 19:05	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 19:05	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 19:05	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 19:05	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 19:05	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-05_WG_180828 **Lab ID: 50204603003** Collected: 08/28/18 09:43 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 19:05	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 19:05	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 19:05	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 19:05	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 19:05	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 19:05	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 19:05	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 19:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 19:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 19:05	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 19:05	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 19:05	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:05	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:05	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 19:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 19:05	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 19:05	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 19:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 19:05	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 19:05	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 19:05	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 19:05	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 19:05	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	96	%.	89-116	1		09/05/18 19:05	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	85-111	1		09/05/18 19:05	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/05/18 19:05	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-07_WG_180828 **Lab ID: 50204603004** Collected: 08/28/18 11:17 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 19:29	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 19:29	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 19:29	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 19:29	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 19:29	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 19:29	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 19:29	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 19:29	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 19:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 19:29	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 19:29	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 19:29	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 19:29	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 19:29	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 19:29	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 19:29	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 19:29	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 19:29	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 19:29	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 19:29	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 19:29	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:29	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 19:29	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 19:29	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 19:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 19:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:29	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:29	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:29	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:29	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:29	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 19:29	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 19:29	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 19:29	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 19:29	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 19:29	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 19:29	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-07_WG_180828 **Lab ID: 50204603004** Collected: 08/28/18 11:17 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 19:29	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 19:29	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 19:29	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 19:29	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 19:29	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 19:29	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 19:29	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 19:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 19:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 19:29	79-34-5	
Tetrachloroethene	**14.3**	ug/L	5.0	1		09/05/18 19:29	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 19:29	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:29	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:29	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 19:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 19:29	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 19:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 19:29	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 19:29	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 19:29	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 19:29	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 19:29	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 19:29	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	98	%.	89-116	1		09/05/18 19:29	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	85-111	1		09/05/18 19:29	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/05/18 19:29	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-11_WG_180828 **Lab ID: 50204603005** Collected: 08/28/18 11:20 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 19:54	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 19:54	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 19:54	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 19:54	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 19:54	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 19:54	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 19:54	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 19:54	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 19:54	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 19:54	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 19:54	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 19:54	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 19:54	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 19:54	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 19:54	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 19:54	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 19:54	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 19:54	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 19:54	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 19:54	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 19:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:54	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:54	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:54	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 19:54	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 19:54	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 19:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 19:54	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 19:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:54	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:54	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 19:54	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:54	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 19:54	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 19:54	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 19:54	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 19:54	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 19:54	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 19:54	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 19:54	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-11_WG_180828 **Lab ID: 50204603005** Collected: 08/28/18 11:20 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 19:54	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 19:54	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 19:54	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 19:54	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 19:54	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 19:54	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 19:54	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 19:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 19:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 19:54	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 19:54	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 19:54	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:54	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 19:54	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 19:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 19:54	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 19:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 19:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 19:54	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 19:54	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 19:54	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 19:54	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 19:54	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	94	%.	89-116	1		09/05/18 19:54	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/05/18 19:54	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/05/18 19:54	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-12_WG_180828 **Lab ID: 50204603006** Collected: 08/28/18 12:12 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 20:18	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 20:18	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 20:18	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 20:18	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 20:18	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 20:18	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 20:18	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 20:18	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 20:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 20:18	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 20:18	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 20:18	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 20:18	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 20:18	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 20:18	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 20:18	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 20:18	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 20:18	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 20:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 20:18	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 20:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 20:18	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 20:18	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 20:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 20:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 20:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 20:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 20:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 20:18	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 20:18	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 20:18	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 20:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 20:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 20:18	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 20:18	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 20:18	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 20:18	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 20:18	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 20:18	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 20:18	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-12_WG_180828 **Lab ID: 50204603006** Collected: 08/28/18 12:12 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 20:18	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 20:18	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 20:18	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 20:18	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 20:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 20:18	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 20:18	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 20:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 20:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 20:18	79-34-5	
Tetrachloroethene	**15.8**	ug/L	5.0	1		09/05/18 20:18	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 20:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 20:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 20:18	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 20:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 20:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 20:18	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 20:18	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 20:18	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 20:18	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 20:18	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	96	%.	89-116	1		09/05/18 20:18	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	85-111	1		09/05/18 20:18	460-00-4	
Toluene-d8 (S)	105	%.	87-110	1		09/05/18 20:18	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-21_WG_180828 **Lab ID: 50204603007** Collected: 08/28/18 13:13 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 20:43	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 20:43	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 20:43	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 20:43	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 20:43	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 20:43	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 20:43	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 20:43	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 20:43	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 20:43	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 20:43	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 20:43	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 20:43	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 20:43	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 20:43	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 20:43	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 20:43	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 20:43	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 20:43	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 20:43	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 20:43	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:43	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:43	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:43	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 20:43	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 20:43	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 20:43	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 20:43	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 20:43	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 20:43	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 20:43	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 20:43	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 20:43	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 20:43	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 20:43	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 20:43	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 20:43	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 20:43	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 20:43	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 20:43	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 20:43	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 20:43	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 20:43	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-21_WG_180828 **Lab ID: 50204603007** Collected: 08/28/18 13:13 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 20:43	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 20:43	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 20:43	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 20:43	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 20:43	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 20:43	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 20:43	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 20:43	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 20:43	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 20:43	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 20:43	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 20:43	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:43	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 20:43	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 20:43	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 20:43	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 20:43	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 20:43	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 20:43	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 20:43	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 20:43	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 20:43	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 20:43	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	94	%.	89-116	1		09/05/18 20:43	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/05/18 20:43	460-00-4	
Toluene-d8 (S)	102	%.	87-110	1		09/05/18 20:43	2037-26-5	

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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-23_WG_180828 **Lab ID: 50204603008** Collected: 08/28/18 14:06 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 21:07	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 21:07	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 21:07	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 21:07	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 21:07	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 21:07	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 21:07	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 21:07	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 21:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 21:07	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 21:07	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 21:07	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 21:07	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 21:07	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 21:07	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 21:07	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 21:07	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 21:07	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 21:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 21:07	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 21:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 21:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 21:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 21:07	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 21:07	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 21:07	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 21:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 21:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 21:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 21:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 21:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 21:07	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 21:07	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 21:07	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 21:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 21:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 21:07	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 21:07	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 21:07	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 21:07	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 21:07	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 21:07	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 21:07	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-23_WG_180828 **Lab ID: 50204603008** Collected: 08/28/18 14:06 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 21:07	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 21:07	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 21:07	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 21:07	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 21:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 21:07	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 21:07	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 21:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 21:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 21:07	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 21:07	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 21:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 21:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 21:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 21:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 21:07	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 21:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 21:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 21:07	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 21:07	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 21:07	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 21:07	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 21:07	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	96	%.	89-116	1		09/05/18 21:07	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/05/18 21:07	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/05/18 21:07	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-25_WG_180828 **Lab ID: 50204603009** Collected: 08/28/18 15:02 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/05/18 23:58	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/05/18 23:58	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/05/18 23:58	107-13-1	
Benzene	ND	ug/L	5.0	1		09/05/18 23:58	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/05/18 23:58	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/05/18 23:58	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/05/18 23:58	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/05/18 23:58	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/05/18 23:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/05/18 23:58	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/05/18 23:58	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/05/18 23:58	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/05/18 23:58	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/05/18 23:58	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/05/18 23:58	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/05/18 23:58	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 23:58	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/05/18 23:58	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/05/18 23:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/05/18 23:58	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/05/18 23:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 23:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 23:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/05/18 23:58	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/05/18 23:58	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/05/18 23:58	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/05/18 23:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/05/18 23:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/05/18 23:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 23:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/05/18 23:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 23:58	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/05/18 23:58	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/05/18 23:58	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/05/18 23:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 23:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/05/18 23:58	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/05/18 23:58	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/05/18 23:58	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/05/18 23:58	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/05/18 23:58	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/05/18 23:58	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/05/18 23:58	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-25_WG_180828 **Lab ID: 50204603009** Collected: 08/28/18 15:02 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/05/18 23:58	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/05/18 23:58	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 23:58	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/05/18 23:58	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/05/18 23:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/05/18 23:58	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/05/18 23:58	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	103-65-1	
Styrene	ND	ug/L	5.0	1		09/05/18 23:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 23:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/05/18 23:58	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/05/18 23:58	127-18-4	
Toluene	ND	ug/L	5.0	1		09/05/18 23:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 23:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/05/18 23:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/05/18 23:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/05/18 23:58	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/05/18 23:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/05/18 23:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/05/18 23:58	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/05/18 23:58	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/05/18 23:58	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/05/18 23:58	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/05/18 23:58	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	98	%.	89-116	1		09/05/18 23:58	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/05/18 23:58	460-00-4	
Toluene-d8 (S)	102	%.	87-110	1		09/05/18 23:58	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-27_WG_180829 **Lab ID: 50204603010** Collected: 08/29/18 10:22 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 00:22	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 00:22	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 00:22	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 00:22	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 00:22	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 00:22	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 00:22	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 00:22	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 00:22	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 00:22	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 00:22	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 00:22	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 00:22	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 00:22	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 00:22	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 00:22	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 00:22	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 00:22	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 00:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 00:22	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 00:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:22	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 00:22	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 00:22	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 00:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 00:22	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 00:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 00:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 00:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 00:22	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 00:22	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 00:22	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 00:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 00:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 00:22	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 00:22	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 00:22	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 00:22	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 00:22	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 00:22	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 00:22	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-27_WG_180829 **Lab ID: 50204603010** Collected: 08/29/18 10:22 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 00:22	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 00:22	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 00:22	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 00:22	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 00:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 00:22	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 00:22	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 00:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 00:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 00:22	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 00:22	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 00:22	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:22	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 00:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 00:22	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 00:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 00:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 00:22	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 00:22	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 00:22	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 00:22	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 00:22	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	98	%.	89-116	1		09/06/18 00:22	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/06/18 00:22	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/06/18 00:22	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-28_WG_180829 **Lab ID: 50204603011** Collected: 08/29/18 11:27 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 00:47	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 00:47	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 00:47	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 00:47	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 00:47	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 00:47	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 00:47	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 00:47	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 00:47	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 00:47	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 00:47	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 00:47	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 00:47	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 00:47	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 00:47	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 00:47	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 00:47	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 00:47	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 00:47	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 00:47	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 00:47	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:47	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:47	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:47	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 00:47	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 00:47	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 00:47	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 00:47	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 00:47	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 00:47	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 00:47	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 00:47	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 00:47	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 00:47	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 00:47	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 00:47	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 00:47	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 00:47	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 00:47	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 00:47	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 00:47	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 00:47	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 00:47	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-28_WG_180829 **Lab ID: 50204603011** Collected: 08/29/18 11:27 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 00:47	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 00:47	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 00:47	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 00:47	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 00:47	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 00:47	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 00:47	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 00:47	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 00:47	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 00:47	79-34-5	
Tetrachloroethene	**17.8**	ug/L	5.0	1		09/06/18 00:47	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 00:47	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:47	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 00:47	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 00:47	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 00:47	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 00:47	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 00:47	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 00:47	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 00:47	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 00:47	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 00:47	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 00:47	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	89-116	1		09/06/18 00:47	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 00:47	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/06/18 00:47	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-29_WG_180829 **Lab ID: 50204603012** Collected: 08/29/18 12:27 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 01:11	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 01:11	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 01:11	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 01:11	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 01:11	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 01:11	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 01:11	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 01:11	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 01:11	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 01:11	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 01:11	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 01:11	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 01:11	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 01:11	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 01:11	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 01:11	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 01:11	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 01:11	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 01:11	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 01:11	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 01:11	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:11	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:11	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:11	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 01:11	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 01:11	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 01:11	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 01:11	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:11	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:11	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:11	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:11	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:11	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:11	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:11	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 01:11	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 01:11	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 01:11	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 01:11	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 01:11	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 01:11	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-29_WG_180829 **Lab ID: 50204603012** Collected: 08/29/18 12:27 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 01:11	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 01:11	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 01:11	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 01:11	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 01:11	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 01:11	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 01:11	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 01:11	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 01:11	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 01:11	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 01:11	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 01:11	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:11	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:11	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 01:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 01:11	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 01:11	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 01:11	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 01:11	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 01:11	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 01:11	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 01:11	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 01:11	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	96	%.	89-116	1		09/06/18 01:11	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 01:11	460-00-4	
Toluene-d8 (S)	102	%.	87-110	1		09/06/18 01:11	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-04_WG_180829 **Lab ID: 50204603013** Collected: 08/29/18 13:22 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 01:36	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 01:36	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 01:36	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 01:36	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 01:36	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 01:36	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 01:36	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 01:36	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 01:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 01:36	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 01:36	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 01:36	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 01:36	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 01:36	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 01:36	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 01:36	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 01:36	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 01:36	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 01:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 01:36	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 01:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 01:36	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 01:36	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 01:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 01:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 01:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:36	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:36	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 01:36	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:36	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 01:36	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 01:36	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 01:36	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 01:36	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 01:36	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 01:36	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 01:36	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-04_WG_180829 **Lab ID: 50204603013** Collected: 08/29/18 13:22 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 01:36	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 01:36	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 01:36	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 01:36	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 01:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 01:36	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 01:36	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 01:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 01:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 01:36	79-34-5	
Tetrachloroethene	**5.7**	ug/L	5.0	1		09/06/18 01:36	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 01:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 01:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 01:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 01:36	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 01:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 01:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 01:36	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 01:36	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 01:36	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 01:36	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 01:36	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	89-116	1		09/06/18 01:36	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	85-111	1		09/06/18 01:36	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 01:36	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-01_WG_180829 **Lab ID: 50204603014** Collected: 08/29/18 14:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 02:00	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 02:00	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 02:00	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 02:00	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 02:00	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 02:00	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 02:00	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 02:00	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 02:00	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 02:00	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 02:00	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 02:00	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 02:00	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 02:00	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 02:00	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 02:00	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 02:00	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 02:00	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 02:00	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 02:00	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 02:00	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:00	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:00	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:00	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 02:00	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 02:00	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 02:00	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 02:00	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:00	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:00	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:00	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:00	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:00	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:00	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:00	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:00	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 02:00	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 02:00	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 02:00	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 02:00	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 02:00	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 02:00	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-01_WG_180829 **Lab ID: 50204603014** Collected: 08/29/18 14:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 02:00	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 02:00	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 02:00	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 02:00	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 02:00	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 02:00	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 02:00	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 02:00	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 02:00	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 02:00	79-34-5	
Tetrachloroethene	**37.4**	ug/L	5.0	1		09/06/18 02:00	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 02:00	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:00	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:00	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 02:00	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 02:00	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 02:00	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 02:00	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 02:00	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 02:00	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 02:00	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 02:00	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 02:00	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	100	%.	89-116	1		09/06/18 02:00	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 02:00	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/06/18 02:00	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-14_WG_180829 **Lab ID: 50204603015** Collected: 08/29/18 15:01 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 02:24	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 02:24	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 02:24	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 02:24	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 02:24	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 02:24	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 02:24	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 02:24	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 02:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 02:24	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 02:24	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 02:24	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 02:24	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 02:24	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 02:24	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 02:24	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 02:24	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 02:24	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 02:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 02:24	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 02:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:24	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 02:24	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 02:24	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 02:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 02:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:24	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:24	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:24	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:24	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 02:24	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 02:24	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 02:24	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 02:24	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 02:24	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 02:24	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-14_WG_180829 **Lab ID: 50204603015** Collected: 08/29/18 15:01 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 02:24	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 02:24	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 02:24	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 02:24	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 02:24	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 02:24	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 02:24	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 02:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 02:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 02:24	79-34-5	
Tetrachloroethene	**14.4**	ug/L	5.0	1		09/06/18 02:24	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 02:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 02:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 02:24	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 02:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 02:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 02:24	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 02:24	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 02:24	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 02:24	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 02:24	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	89-116	1		09/06/18 02:24	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 02:24	460-00-4	
Toluene-d8 (S)	99	%.	87-110	1		09/06/18 02:24	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-17_WG_180828 **Lab ID: 50204603016** Collected: 08/28/18 12:30 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 02:49	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 02:49	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 02:49	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 02:49	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 02:49	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 02:49	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 02:49	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 02:49	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 02:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 02:49	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 02:49	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 02:49	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 02:49	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 02:49	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 02:49	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 02:49	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 02:49	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 02:49	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 02:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 02:49	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 02:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:49	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 02:49	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 02:49	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 02:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 02:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 02:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 02:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 02:49	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 02:49	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 02:49	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 02:49	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 02:49	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 02:49	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 02:49	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-17_WG_180828 **Lab ID: 50204603016** Collected: 08/28/18 12:30 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 02:49	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 02:49	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 02:49	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 02:49	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 02:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 02:49	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 02:49	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 02:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 02:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 02:49	79-34-5	
Tetrachloroethene	**26.3**	ug/L	5.0	1		09/06/18 02:49	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 02:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 02:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 02:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 02:49	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 02:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 02:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 02:49	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 02:49	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 02:49	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 02:49	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 02:49	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	98	%.	89-116	1		09/06/18 02:49	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 02:49	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 02:49	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-13_WG_180829 **Lab ID: 50204603017** Collected: 08/29/18 15:45 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 03:13	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 03:13	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 03:13	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 03:13	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 03:13	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 03:13	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 03:13	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 03:13	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 03:13	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 03:13	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 03:13	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 03:13	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 03:13	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 03:13	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 03:13	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 03:13	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 03:13	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 03:13	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 03:13	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 03:13	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 03:13	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:13	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:13	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:13	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 03:13	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 03:13	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 03:13	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 03:13	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 03:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 03:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 03:13	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 03:13	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 03:13	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 03:13	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 03:13	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 03:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 03:13	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 03:13	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 03:13	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 03:13	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 03:13	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 03:13	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 03:13	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-13_WG_180829 **Lab ID: 50204603017** Collected: 08/29/18 15:45 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 03:13	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 03:13	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 03:13	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 03:13	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 03:13	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 03:13	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 03:13	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 03:13	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 03:13	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 03:13	79-34-5	
Tetrachloroethene	**21.8**	ug/L	5.0	1		09/06/18 03:13	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 03:13	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:13	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:13	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 03:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 03:13	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 03:13	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 03:13	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 03:13	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 03:13	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 03:13	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 03:13	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 03:13	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	101	%.	89-116	1		09/06/18 03:13	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 03:13	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 03:13	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-10_WG_180828 **Lab ID: 50204603018** Collected: 08/28/18 14:15 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 03:38	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 03:38	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 03:38	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 03:38	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 03:38	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 03:38	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 03:38	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 03:38	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 03:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 03:38	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 03:38	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 03:38	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 03:38	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 03:38	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 03:38	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 03:38	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 03:38	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 03:38	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 03:38	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 03:38	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 03:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:38	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:38	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:38	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 03:38	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 03:38	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 03:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 03:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 03:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 03:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 03:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 03:38	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 03:38	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 03:38	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 03:38	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 03:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 03:38	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 03:38	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 03:38	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 03:38	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 03:38	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 03:38	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 03:38	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-10_WG_180828 **Lab ID: 50204603018** Collected: 08/28/18 14:15 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 03:38	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 03:38	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 03:38	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 03:38	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 03:38	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 03:38	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 03:38	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 03:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 03:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 03:38	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 03:38	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 03:38	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:38	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 03:38	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 03:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 03:38	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 03:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 03:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 03:38	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 03:38	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 03:38	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 03:38	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 03:38	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	102	%.	89-116	1		09/06/18 03:38	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	85-111	1		09/06/18 03:38	460-00-4	
Toluene-d8 (S)	99	%.	87-110	1		09/06/18 03:38	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-08_WG_180828 **Lab ID: 50204603019** Collected: 08/28/18 15:20 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 04:02	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 04:02	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 04:02	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 04:02	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 04:02	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 04:02	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 04:02	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 04:02	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 04:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 04:02	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 04:02	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 04:02	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 04:02	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 04:02	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 04:02	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 04:02	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 04:02	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 04:02	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 04:02	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 04:02	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 04:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:02	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 04:02	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 04:02	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 04:02	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 04:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:02	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:02	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:02	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:02	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:02	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 04:02	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 04:02	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 04:02	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 04:02	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 04:02	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 04:02	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-08_WG_180828 **Lab ID: 50204603019** Collected: 08/28/18 15:20 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 04:02	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 04:02	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 04:02	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 04:02	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 04:02	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 04:02	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 04:02	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 04:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 04:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 04:02	79-34-5	
Tetrachloroethene	**84.6**	ug/L	5.0	1		09/06/18 04:02	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 04:02	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:02	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:02	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 04:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 04:02	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 04:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 04:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 04:02	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 04:02	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 04:02	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 04:02	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 04:02	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/06/18 04:02	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/06/18 04:02	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 04:02	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-16_WG_180829 **Lab ID: 50204603020** Collected: 08/29/18 10:30 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 04:27	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 04:27	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 04:27	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 04:27	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 04:27	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 04:27	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 04:27	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 04:27	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 04:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 04:27	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 04:27	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 04:27	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 04:27	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 04:27	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 04:27	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 04:27	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 04:27	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 04:27	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 04:27	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 04:27	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 04:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:27	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:27	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:27	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 04:27	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 04:27	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 04:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 04:27	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:27	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:27	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:27	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:27	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:27	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:27	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 04:27	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 04:27	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 04:27	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 04:27	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 04:27	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 04:27	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-16_WG_180829 **Lab ID: 50204603020** Collected: 08/29/18 10:30 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 04:27	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 04:27	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 04:27	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 04:27	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 04:27	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 04:27	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 04:27	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 04:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 04:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 04:27	79-34-5	
Tetrachloroethene	**20.3**	ug/L	5.0	1		09/06/18 04:27	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 04:27	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:27	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:27	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 04:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 04:27	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 04:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 04:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 04:27	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 04:27	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 04:27	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 04:27	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 04:27	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	101	%.	89-116	1		09/06/18 04:27	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 04:27	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 04:27	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-18_WG_180830 **Lab ID: 50204603021** Collected: 08/30/18 09:22 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 04:51	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 04:51	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 04:51	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 04:51	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 04:51	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 04:51	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 04:51	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 04:51	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 04:51	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 04:51	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 04:51	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 04:51	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 04:51	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 04:51	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 04:51	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 04:51	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 04:51	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 04:51	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 04:51	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 04:51	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 04:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:51	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:51	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:51	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 04:51	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 04:51	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 04:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 04:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 04:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:51	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:51	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 04:51	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:51	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 04:51	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 04:51	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 04:51	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 04:51	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 04:51	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 04:51	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 04:51	98-82-8	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-18_WG_180830 **Lab ID: 50204603021** Collected: 08/30/18 09:22 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 04:51	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 04:51	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 04:51	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 04:51	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 04:51	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 04:51	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 04:51	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 04:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 04:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 04:51	79-34-5	
Tetrachloroethene	**20.0**	ug/L	5.0	1		09/06/18 04:51	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 04:51	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:51	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 04:51	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 04:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 04:51	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 04:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 04:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 04:51	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 04:51	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 04:51	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 04:51	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 04:51	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	89-116	1		09/06/18 04:51	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	85-111	1		09/06/18 04:51	460-00-4	
Toluene-d8 (S)	101	%.	87-110	1		09/06/18 04:51	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-20_WG_180830 **Lab ID: 50204603022** Collected: 08/30/18 10:16 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 05:15	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 05:15	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 05:15	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 05:15	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 05:15	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 05:15	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 05:15	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 05:15	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 05:15	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 05:15	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 05:15	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 05:15	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 05:15	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 05:15	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 05:15	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 05:15	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 05:15	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 05:15	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 05:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 05:15	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 05:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:15	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 05:15	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 05:15	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 05:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 05:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 05:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 05:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 05:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 05:15	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 05:15	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 05:15	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 05:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 05:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 05:15	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 05:15	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 05:15	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 05:15	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 05:15	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 05:15	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 05:15	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-20_WG_180830 **Lab ID: 50204603022** Collected: 08/30/18 10:16 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 05:15	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 05:15	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 05:15	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 05:15	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 05:15	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 05:15	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 05:15	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 05:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 05:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 05:15	79-34-5	
Tetrachloroethene	**12.8**	ug/L	5.0	1		09/06/18 05:15	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 05:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 05:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 05:15	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 05:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 05:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 05:15	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 05:15	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 05:15	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 05:15	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 05:15	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/06/18 05:15	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 05:15	460-00-4	
Toluene-d8 (S)	102	%.	87-110	1		09/06/18 05:15	2037-26-5	

Pace Analytical Services, LLC
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-06_WG_180830 **Lab ID: 50204603023** Collected: 08/30/18 11:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 05:40	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 05:40	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 05:40	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 05:40	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 05:40	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 05:40	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 05:40	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 05:40	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 05:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 05:40	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 05:40	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 05:40	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 05:40	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 05:40	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 05:40	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 05:40	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 05:40	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 05:40	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 05:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 05:40	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 05:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 05:40	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 05:40	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 05:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 05:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 05:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 05:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 05:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 05:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 05:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 05:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 05:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 05:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 05:40	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 05:40	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 05:40	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 05:40	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 05:40	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 05:40	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 05:40	98-82-8	

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7726 Moller Road
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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-06_WG_180830 **Lab ID: 50204603023** Collected: 08/30/18 11:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 05:40	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 05:40	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 05:40	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 05:40	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 05:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 05:40	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 05:40	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 05:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 05:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 05:40	79-34-5	
Tetrachloroethene	**100**	ug/L	5.0	1		09/06/18 05:40	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 05:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 05:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 05:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 05:40	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 05:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 05:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 05:40	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 05:40	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 05:40	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 05:40	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 05:40	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	89-116	1		09/06/18 05:40	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 05:40	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 05:40	2037-26-5	

Pace Analytical Services, LLC
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(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-19_WG_180829 **Lab ID: 50204603024** Collected: 08/29/18 12:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 06:04	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 06:04	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 06:04	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 06:04	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 06:04	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 06:04	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 06:04	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 06:04	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 06:04	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 06:04	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 06:04	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 06:04	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 06:04	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 06:04	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 06:04	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 06:04	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 06:04	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 06:04	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 06:04	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 06:04	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 06:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:04	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:04	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:04	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 06:04	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 06:04	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 06:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 06:04	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:04	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:04	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:04	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:04	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:04	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 06:04	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 06:04	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 06:04	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 06:04	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 06:04	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 06:04	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-19_WG_180829 **Lab ID: 50204603024** Collected: 08/29/18 12:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 06:04	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 06:04	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 06:04	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 06:04	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 06:04	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 06:04	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 06:04	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 06:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 06:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 06:04	79-34-5	
Tetrachloroethene	**67.8**	ug/L	5.0	1		09/06/18 06:04	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 06:04	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:04	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:04	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 06:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 06:04	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 06:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 06:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 06:04	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 06:04	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 06:04	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 06:04	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 06:04	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	96	%.	89-116	1		09/06/18 06:04	1868-53-7	
4-Bromofluorobenzene (S)	101	%.	85-111	1		09/06/18 06:04	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 06:04	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-9D_WG_180829 **Lab ID: 50204603025** Collected: 08/29/18 13:30 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 06:29	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 06:29	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 06:29	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 06:29	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 06:29	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 06:29	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 06:29	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 06:29	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 06:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 06:29	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 06:29	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 06:29	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 06:29	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 06:29	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 06:29	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 06:29	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 06:29	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 06:29	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 06:29	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 06:29	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 06:29	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:29	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:29	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:29	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 06:29	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 06:29	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 06:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 06:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:29	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:29	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:29	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:29	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:29	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 06:29	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 06:29	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 06:29	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 06:29	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 06:29	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 06:29	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-9D_WG_180829 **Lab ID: 50204603025** Collected: 08/29/18 13:30 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 06:29	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 06:29	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 06:29	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 06:29	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 06:29	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 06:29	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 06:29	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 06:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 06:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 06:29	79-34-5	
Tetrachloroethene	**10.6**	ug/L	5.0	1		09/06/18 06:29	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 06:29	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:29	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:29	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 06:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 06:29	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 06:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 06:29	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 06:29	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 06:29	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 06:29	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 06:29	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 06:29	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	97	%.	89-116	1		09/06/18 06:29	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	85-111	1		09/06/18 06:29	460-00-4	
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 06:29	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-09_WG_180829 **Lab ID: 50204603026** Collected: 08/29/18 14:25 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 06:53	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 06:53	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 06:53	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 06:53	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 06:53	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 06:53	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 06:53	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 06:53	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 06:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 06:53	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 06:53	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 06:53	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 06:53	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 06:53	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 06:53	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 06:53	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 06:53	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 06:53	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 06:53	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 06:53	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 06:53	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:53	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:53	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:53	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 06:53	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 06:53	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 06:53	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 06:53	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 06:53	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:53	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:53	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 06:53	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:53	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 06:53	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 06:53	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 06:53	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 06:53	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 06:53	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 06:53	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 06:53	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-09_WG_180829 **Lab ID: 50204603026** Collected: 08/29/18 14:25 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 06:53	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 06:53	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 06:53	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 06:53	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 06:53	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 06:53	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 06:53	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 06:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 06:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 06:53	79-34-5	
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 06:53	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 06:53	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:53	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 06:53	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 06:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 06:53	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 06:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 06:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 06:53	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 06:53	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 06:53	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 06:53	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 06:53	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/06/18 06:53	1868-53-7	
4-Bromofluorobenzene (S)	98	%.	85-111	1		09/06/18 06:53	460-00-4	
Toluene-d8 (S)	99	%.	87-110	1		09/06/18 06:53	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-26_WG_180829 **Lab ID: 50204603027** Collected: 08/29/18 16:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 07:18	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 07:18	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 07:18	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 07:18	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 07:18	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 07:18	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 07:18	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 07:18	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 07:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 07:18	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 07:18	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 07:18	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 07:18	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 07:18	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 07:18	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 07:18	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 07:18	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 07:18	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 07:18	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 07:18	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 07:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:18	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:18	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 07:18	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 07:18	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 07:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 07:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 07:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 07:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 07:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 07:18	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 07:18	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 07:18	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 07:18	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 07:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 07:18	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 07:18	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 07:18	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 07:18	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 07:18	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 07:18	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 07:18	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-26_WG_180829 **Lab ID: 50204603027** Collected: 08/29/18 16:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 07:18	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 07:18	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 07:18	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 07:18	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 07:18	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 07:18	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 07:18	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 07:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 07:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 07:18	79-34-5	
Tetrachloroethene	**154**	ug/L	5.0	1		09/06/18 07:18	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 07:18	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:18	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:18	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 07:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 07:18	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 07:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 07:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 07:18	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 07:18	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 07:18	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 07:18	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 07:18	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/06/18 07:18	1868-53-7	
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/06/18 07:18	460-00-4	
Toluene-d8 (S)	100	%.	87-110	1		09/06/18 07:18	2037-26-5	

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-22_WG_180830 **Lab ID: 50204603028** Collected: 08/30/18 11:58 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 07:42	67-64-1	
Acrolein	ND	ug/L	50.0	1		09/06/18 07:42	107-02-8	
Acrylonitrile	ND	ug/L	100	1		09/06/18 07:42	107-13-1	
Benzene	ND	ug/L	5.0	1		09/06/18 07:42	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		09/06/18 07:42	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 07:42	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 07:42	75-27-4	
Bromoform	ND	ug/L	5.0	1		09/06/18 07:42	75-25-2	
Bromomethane	ND	ug/L	5.0	1		09/06/18 07:42	74-83-9	
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 07:42	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	98-06-6	
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 07:42	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 07:42	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 07:42	108-90-7	
Chloroethane	ND	ug/L	5.0	1		09/06/18 07:42	75-00-3	
Chloroform	ND	ug/L	5.0	1		09/06/18 07:42	67-66-3	
Chloromethane	ND	ug/L	5.0	1		09/06/18 07:42	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 07:42	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 07:42	106-43-4	
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 07:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 07:42	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		09/06/18 07:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:42	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 07:42	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 07:42	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 07:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 07:42	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 07:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 07:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 07:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 07:42	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 07:42	142-28-9	
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 07:42	594-20-7	
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 07:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 07:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 07:42	10061-02-6	
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	100-41-4	
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 07:42	97-63-2	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 07:42	87-68-3	
n-Hexane	ND	ug/L	5.0	1		09/06/18 07:42	110-54-3	
2-Hexanone	ND	ug/L	25.0	1		09/06/18 07:42	591-78-6	
Iodomethane	ND	ug/L	10.0	1		09/06/18 07:42	74-88-4	
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 07:42	98-82-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-22_WG_180830 **Lab ID: 50204603028** Collected: 08/30/18 11:58 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 07:42	99-87-6	
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 07:42	75-09-2	
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 07:42	90-12-0	N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 07:42	91-57-6	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 07:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 07:42	1634-04-4	
Naphthalene	ND	ug/L	1.7	1		09/06/18 07:42	91-20-3	
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	103-65-1	
Styrene	ND	ug/L	5.0	1		09/06/18 07:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 07:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 07:42	79-34-5	
Tetrachloroethene	**97.9**	ug/L	5.0	1		09/06/18 07:42	127-18-4	
Toluene	ND	ug/L	5.0	1		09/06/18 07:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 07:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 07:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 07:42	79-00-5	
Trichloroethene	ND	ug/L	5.0	1		09/06/18 07:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 07:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 07:42	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 07:42	108-67-8	
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 07:42	108-05-4	
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 07:42	75-01-4	
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 07:42	1330-20-7	
Surrogates								
Dibromofluoromethane (S)	100	%.	89-116	1		09/06/18 07:42	1868-53-7	
4-Bromofluorobenzene (S)	97	%.	85-111	1		09/06/18 07:42	460-00-4	
Toluene-d8 (S)	99	%.	87-110	1		09/06/18 07:42	2037-26-5	

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-24_WG_180830 **Lab ID: 50204603029** Collected: 08/30/18 09:40 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 20:20	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 20:20	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 20:20	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 20:20	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 20:20	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 20:20	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 20:20	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 20:20	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 20:20	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 20:20	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 20:20	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 20:20	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 20:20	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 20:20	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 20:20	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 20:20	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 20:20	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 20:20	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 20:20	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 20:20	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 20:20	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 20:20	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 20:20	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 20:20	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 20:20	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 20:20	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 20:20	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 20:20	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 20:20	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 20:20	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 20:20	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 20:20	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 20:20	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 20:20	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 20:20	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 20:20	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 20:20	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 20:20	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 20:20	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 20:20	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 20:20	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 20:20	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 20:20	98-82-8	M5

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-24_WG_180830 **Lab ID: 50204603029** Collected: 08/30/18 09:40 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 20:20	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 20:20	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 20:20	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 20:20	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 20:20	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 20:20	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 20:20	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 20:20	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 20:20	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 20:20	79-34-5	M5
Tetrachloroethene	**108**	ug/L	5.0	1		09/06/18 20:20	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 20:20	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 20:20	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 20:20	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 20:20	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 20:20	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 20:20	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 20:20	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 20:20	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 20:20	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 20:20	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 20:20	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 20:20	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	101	%.	89-116	1		09/06/18 20:20	1868-53-7	M5
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 20:20	460-00-4	M5
Toluene-d8 (S)	98	%.	87-110	1		09/06/18 20:20	2037-26-5	M5

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-15D_WG_180830 **Lab ID: 50204603030** Collected: 08/30/18 11:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 16:41	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 16:41	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 16:41	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 16:41	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 16:41	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 16:41	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 16:41	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 16:41	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 16:41	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 16:41	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 16:41	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 16:41	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 16:41	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 16:41	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 16:41	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 16:41	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 16:41	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 16:41	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 16:41	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 16:41	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 16:41	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 16:41	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 16:41	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 16:41	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 16:41	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 16:41	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 16:41	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 16:41	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 16:41	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 16:41	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 16:41	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 16:41	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 16:41	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 16:41	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 16:41	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 16:41	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 16:41	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 16:41	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 16:41	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 16:41	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 16:41	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 16:41	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 16:41	98-82-8	M5

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-15D_WG_180830 **Lab ID: 50204603030** Collected: 08/30/18 11:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 16:41	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 16:41	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 16:41	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 16:41	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 16:41	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 16:41	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 16:41	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 16:41	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 16:41	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 16:41	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 16:41	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 16:41	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 16:41	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 16:41	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 16:41	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 16:41	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 16:41	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 16:41	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 16:41	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 16:41	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 16:41	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 16:41	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 16:41	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	101	%.	89-116	1		09/06/18 16:41	1868-53-7	M5
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/06/18 16:41	460-00-4	M5
Toluene-d8 (S)	105	%.	87-110	1		09/06/18 16:41	2037-26-5	M5

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-15_WG_180830 **Lab ID: 50204603031** Collected: 08/30/18 11:45 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 17:05	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 17:05	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 17:05	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 17:05	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 17:05	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 17:05	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 17:05	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 17:05	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 17:05	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 17:05	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 17:05	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 17:05	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 17:05	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 17:05	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 17:05	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 17:05	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 17:05	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 17:05	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 17:05	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 17:05	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 17:05	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:05	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:05	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:05	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 17:05	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 17:05	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 17:05	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 17:05	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:05	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:05	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:05	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:05	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:05	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:05	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:05	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:05	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:05	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 17:05	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 17:05	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 17:05	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 17:05	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 17:05	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 17:05	98-82-8	M5

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: MW-15_WG_180830 **Lab ID: 50204603031** Collected: 08/30/18 11:45 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 17:05	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 17:05	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 17:05	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 17:05	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 17:05	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 17:05	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 17:05	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 17:05	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 17:05	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 17:05	79-34-5	M5
Tetrachloroethene	**128**	ug/L	5.0	1		09/06/18 17:05	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 17:05	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:05	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:05	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 17:05	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 17:05	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 17:05	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 17:05	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 17:05	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 17:05	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 17:05	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 17:05	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 17:05	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	100	%.	89-116	1		09/06/18 17:05	1868-53-7	M5
4-Bromofluorobenzene (S)	97	%.	85-111	1		09/06/18 17:05	460-00-4	M5
Toluene-d8 (S)	105	%.	87-110	1		09/06/18 17:05	2037-26-5	M5

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: DUP-01_WG_180830 **Lab ID: 50204603032** Collected: 08/30/18 00:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 17:29	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 17:29	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 17:29	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 17:29	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 17:29	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 17:29	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 17:29	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 17:29	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 17:29	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 17:29	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 17:29	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 17:29	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 17:29	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 17:29	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 17:29	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 17:29	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 17:29	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 17:29	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 17:29	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 17:29	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 17:29	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:29	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:29	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:29	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 17:29	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 17:29	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 17:29	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 17:29	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:29	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:29	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:29	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:29	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:29	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:29	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:29	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:29	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:29	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 17:29	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 17:29	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 17:29	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 17:29	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 17:29	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 17:29	98-82-8	M5

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: DUP-01_WG_180830 **Lab ID: 50204603032** Collected: 08/30/18 00:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 17:29	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 17:29	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 17:29	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 17:29	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 17:29	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 17:29	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 17:29	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 17:29	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 17:29	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 17:29	79-34-5	M5
Tetrachloroethene	**208**	ug/L	5.0	1		09/06/18 17:29	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 17:29	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:29	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:29	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 17:29	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 17:29	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 17:29	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 17:29	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 17:29	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 17:29	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 17:29	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 17:29	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 17:29	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/06/18 17:29	1868-53-7	M5
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 17:29	460-00-4	M5
Toluene-d8 (S)	103	%.	87-110	1		09/06/18 17:29	2037-26-5	M5

Pace Analytical Services, LLC
7726 Moller Road
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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: DUP-02_WG_180830 **Lab ID: 50204603033** Collected: 08/30/18 00:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 17:54	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 17:54	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 17:54	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 17:54	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 17:54	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 17:54	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 17:54	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 17:54	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 17:54	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 17:54	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 17:54	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 17:54	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 17:54	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 17:54	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 17:54	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 17:54	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 17:54	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 17:54	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 17:54	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 17:54	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 17:54	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:54	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:54	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:54	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 17:54	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 17:54	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 17:54	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 17:54	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:54	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:54	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 17:54	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:54	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:54	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 17:54	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:54	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:54	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 17:54	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 17:54	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 17:54	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 17:54	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 17:54	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 17:54	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 17:54	98-82-8	M5

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: DUP-02_WG_180830 **Lab ID: 50204603033** Collected: 08/30/18 00:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 17:54	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 17:54	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 17:54	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 17:54	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 17:54	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 17:54	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 17:54	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 17:54	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 17:54	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 17:54	79-34-5	M5
Tetrachloroethene	**132**	ug/L	5.0	1		09/06/18 17:54	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 17:54	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:54	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 17:54	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 17:54	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 17:54	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 17:54	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 17:54	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 17:54	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 17:54	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 17:54	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 17:54	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 17:54	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	99	%.	89-116	1		09/06/18 17:54	1868-53-7	M5
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/06/18 17:54	460-00-4	M5
Toluene-d8 (S)	102	%.	87-110	1		09/06/18 17:54	2037-26-5	M5

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: EQB-1_WD_180830 **Lab ID: 50204603034** Collected: 08/30/18 11:20 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 18:18	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 18:18	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 18:18	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 18:18	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 18:18	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 18:18	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 18:18	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 18:18	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 18:18	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 18:18	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 18:18	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 18:18	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 18:18	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 18:18	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 18:18	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 18:18	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 18:18	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 18:18	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 18:18	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 18:18	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 18:18	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:18	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:18	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:18	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 18:18	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 18:18	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 18:18	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 18:18	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 18:18	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 18:18	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 18:18	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 18:18	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 18:18	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 18:18	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 18:18	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 18:18	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 18:18	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 18:18	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 18:18	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 18:18	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 18:18	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 18:18	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 18:18	98-82-8	M5

REPORT OF LABORATORY ANALYSIS

Pace Analytical
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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: EQB-1_WD_180830 **Lab ID: 50204603034** Collected: 08/30/18 11:20 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 18:18	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 18:18	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 18:18	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 18:18	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 18:18	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 18:18	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 18:18	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 18:18	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 18:18	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 18:18	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 18:18	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 18:18	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:18	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:18	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 18:18	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 18:18	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 18:18	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 18:18	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 18:18	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 18:18	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 18:18	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 18:18	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 18:18	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	102	%.	89-116	1		09/06/18 18:18	1868-53-7	M5
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 18:18	460-00-4	M5
Toluene-d8 (S)	102	%.	87-110	1		09/06/18 18:18	2037-26-5	M5

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: EQB-2_WD_180830 **Lab ID: 50204603035** Collected: 08/30/18 11:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 18:42	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 18:42	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 18:42	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 18:42	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 18:42	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 18:42	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 18:42	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 18:42	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 18:42	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 18:42	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 18:42	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 18:42	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 18:42	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 18:42	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 18:42	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 18:42	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 18:42	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 18:42	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 18:42	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 18:42	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 18:42	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:42	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:42	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:42	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 18:42	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 18:42	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 18:42	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 18:42	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 18:42	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 18:42	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 18:42	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 18:42	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 18:42	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 18:42	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 18:42	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 18:42	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 18:42	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 18:42	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 18:42	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 18:42	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 18:42	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 18:42	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 18:42	98-82-8	M5

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: EQB-2_WD_180830 **Lab ID: 50204603035** Collected: 08/30/18 11:10 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 18:42	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 18:42	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 18:42	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 18:42	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 18:42	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 18:42	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 18:42	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 18:42	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 18:42	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 18:42	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 18:42	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 18:42	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:42	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 18:42	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 18:42	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 18:42	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 18:42	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 18:42	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 18:42	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 18:42	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 18:42	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 18:42	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 18:42	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	98	%.	89-116	1		09/06/18 18:42	1868-53-7	M5
4-Bromofluorobenzene (S)	100	%.	85-111	1		09/06/18 18:42	460-00-4	M5
Toluene-d8 (S)	101	%.	87-110	1		09/06/18 18:42	2037-26-5	M5

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: TB-01_WD_180827 **Lab ID: 50204603036** Collected: 08/27/18 00:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
Acetone	ND	ug/L	100	1		09/06/18 19:06	67-64-1	M5
Acrolein	ND	ug/L	50.0	1		09/06/18 19:06	107-02-8	M5
Acrylonitrile	ND	ug/L	100	1		09/06/18 19:06	107-13-1	M5
Benzene	ND	ug/L	5.0	1		09/06/18 19:06	71-43-2	M5
Bromobenzene	ND	ug/L	5.0	1		09/06/18 19:06	108-86-1	M5
Bromochloromethane	ND	ug/L	5.0	1		09/06/18 19:06	74-97-5	M5
Bromodichloromethane	ND	ug/L	5.0	1		09/06/18 19:06	75-27-4	M5
Bromoform	ND	ug/L	5.0	1		09/06/18 19:06	75-25-2	M5
Bromomethane	ND	ug/L	5.0	1		09/06/18 19:06	74-83-9	M5
2-Butanone (MEK)	ND	ug/L	25.0	1		09/06/18 19:06	78-93-3	M5
n-Butylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	104-51-8	M5
sec-Butylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	135-98-8	M5
tert-Butylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	98-06-6	M5
Carbon disulfide	ND	ug/L	10.0	1		09/06/18 19:06	75-15-0	M5
Carbon tetrachloride	ND	ug/L	5.0	1		09/06/18 19:06	56-23-5	M5
Chlorobenzene	ND	ug/L	5.0	1		09/06/18 19:06	108-90-7	M5
Chloroethane	ND	ug/L	5.0	1		09/06/18 19:06	75-00-3	M5
Chloroform	ND	ug/L	5.0	1		09/06/18 19:06	67-66-3	M5
Chloromethane	ND	ug/L	5.0	1		09/06/18 19:06	74-87-3	M5
2-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 19:06	95-49-8	M5
4-Chlorotoluene	ND	ug/L	5.0	1		09/06/18 19:06	106-43-4	M5
Dibromochloromethane	ND	ug/L	5.0	1		09/06/18 19:06	124-48-1	M5
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		09/06/18 19:06	106-93-4	M5
Dibromomethane	ND	ug/L	5.0	1		09/06/18 19:06	74-95-3	M5
1,2-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 19:06	95-50-1	M5
1,3-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 19:06	541-73-1	M5
1,4-Dichlorobenzene	ND	ug/L	5.0	1		09/06/18 19:06	106-46-7	M5
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		09/06/18 19:06	110-57-6	M5
Dichlorodifluoromethane	ND	ug/L	5.0	1		09/06/18 19:06	75-71-8	M5
1,1-Dichloroethane	ND	ug/L	5.0	1		09/06/18 19:06	75-34-3	M5
1,2-Dichloroethane	ND	ug/L	5.0	1		09/06/18 19:06	107-06-2	M5
1,1-Dichloroethene	ND	ug/L	5.0	1		09/06/18 19:06	75-35-4	M5
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 19:06	156-59-2	M5
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		09/06/18 19:06	156-60-5	M5
1,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 19:06	78-87-5	M5
1,3-Dichloropropane	ND	ug/L	5.0	1		09/06/18 19:06	142-28-9	M5
2,2-Dichloropropane	ND	ug/L	5.0	1		09/06/18 19:06	594-20-7	M5
1,1-Dichloropropene	ND	ug/L	5.0	1		09/06/18 19:06	563-58-6	M5
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 19:06	10061-01-5	M5
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		09/06/18 19:06	10061-02-6	M5
Ethylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	100-41-4	M5
Ethyl methacrylate	ND	ug/L	100	1		09/06/18 19:06	97-63-2	M5
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		09/06/18 19:06	87-68-3	M5
n-Hexane	ND	ug/L	5.0	1		09/06/18 19:06	110-54-3	M5
2-Hexanone	ND	ug/L	25.0	1		09/06/18 19:06	591-78-6	M5
Iodomethane	ND	ug/L	10.0	1		09/06/18 19:06	74-88-4	M5
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		09/06/18 19:06	98-82-8	M5

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ANALYTICAL RESULTS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Sample: TB-01_WD_180827 **Lab ID: 50204603036** Collected: 08/27/18 00:00 Received: 08/30/18 17:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Indiana	Analytical Method: EPA 5030/8260							
p-Isopropyltoluene	ND	ug/L	5.0	1		09/06/18 19:06	99-87-6	M5
Methylene Chloride	ND	ug/L	5.0	1		09/06/18 19:06	75-09-2	M5
1-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 19:06	90-12-0	M5,N2
2-Methylnaphthalene	ND	ug/L	10.0	1		09/06/18 19:06	91-57-6	M5
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		09/06/18 19:06	108-10-1	M5
Methyl-tert-butyl ether	ND	ug/L	4.0	1		09/06/18 19:06	1634-04-4	M5
Naphthalene	ND	ug/L	1.7	1		09/06/18 19:06	91-20-3	M5
n-Propylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	103-65-1	M5
Styrene	ND	ug/L	5.0	1		09/06/18 19:06	100-42-5	M5
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 19:06	630-20-6	M5
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		09/06/18 19:06	79-34-5	M5
Tetrachloroethene	ND	ug/L	5.0	1		09/06/18 19:06	127-18-4	M5
Toluene	ND	ug/L	5.0	1		09/06/18 19:06	108-88-3	M5
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 19:06	87-61-6	M5
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		09/06/18 19:06	120-82-1	M5
1,1,1-Trichloroethane	ND	ug/L	5.0	1		09/06/18 19:06	71-55-6	M5
1,1,2-Trichloroethane	ND	ug/L	5.0	1		09/06/18 19:06	79-00-5	M5
Trichloroethene	ND	ug/L	5.0	1		09/06/18 19:06	79-01-6	M5
Trichlorofluoromethane	ND	ug/L	5.0	1		09/06/18 19:06	75-69-4	M5
1,2,3-Trichloropropane	ND	ug/L	5.0	1		09/06/18 19:06	96-18-4	M5
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	95-63-6	M5
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		09/06/18 19:06	108-67-8	M5
Vinyl acetate	ND	ug/L	50.0	1		09/06/18 19:06	108-05-4	M5
Vinyl chloride	ND	ug/L	2.0	1		09/06/18 19:06	75-01-4	M5
Xylene (Total)	ND	ug/L	10.0	1		09/06/18 19:06	1330-20-7	M5
Surrogates								
Dibromofluoromethane (S)	98	%.	89-116	1		09/06/18 19:06	1868-53-7	M5
4-Bromofluorobenzene (S)	99	%.	85-111	1		09/06/18 19:06	460-00-4	M5
Toluene-d8 (S)	100	%.	87-110	1		09/06/18 19:06	2037-26-5	M5

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

QC Batch: 460081 Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50204603001, 50204603002, 50204603003, 50204603004, 50204603005, 50204603006, 50204603007, 50204603008

METHOD BLANK: 2123026 Matrix: Water
Associated Lab Samples: 50204603001, 50204603002, 50204603003, 50204603004, 50204603005, 50204603006, 50204603007, 50204603008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	09/05/18 12:58	
1,1,1-Trichloroethane	ug/L	ND	5.0	09/05/18 12:58	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	09/05/18 12:58	
1,1,2-Trichloroethane	ug/L	ND	5.0	09/05/18 12:58	
1,1-Dichloroethane	ug/L	ND	5.0	09/05/18 12:58	
1,1-Dichloroethene	ug/L	ND	5.0	09/05/18 12:58	
1,1-Dichloropropene	ug/L	ND	5.0	09/05/18 12:58	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	09/05/18 12:58	
1,2,3-Trichloropropane	ug/L	ND	5.0	09/05/18 12:58	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	09/05/18 12:58	
1,2,4-Trimethylbenzene	ug/L	ND	5.0	09/05/18 12:58	
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	09/05/18 12:58	
1,2-Dichlorobenzene	ug/L	ND	5.0	09/05/18 12:58	
1,2-Dichloroethane	ug/L	ND	5.0	09/05/18 12:58	
1,2-Dichloropropane	ug/L	ND	5.0	09/05/18 12:58	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	09/05/18 12:58	
1,3-Dichlorobenzene	ug/L	ND	5.0	09/05/18 12:58	
1,3-Dichloropropane	ug/L	ND	5.0	09/05/18 12:58	
1,4-Dichlorobenzene	ug/L	ND	5.0	09/05/18 12:58	
1-Methylnaphthalene	ug/L	ND	10.0	09/05/18 12:58	N2
2,2-Dichloropropane	ug/L	ND	5.0	09/05/18 12:58	
2-Butanone (MEK)	ug/L	ND	25.0	09/05/18 12:58	
2-Chlorotoluene	ug/L	ND	5.0	09/05/18 12:58	
2-Hexanone	ug/L	ND	25.0	09/05/18 12:58	
2-Methylnaphthalene	ug/L	ND	10.0	09/05/18 12:58	
4-Chlorotoluene	ug/L	ND	5.0	09/05/18 12:58	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	09/05/18 12:58	
Acetone	ug/L	ND	100	09/05/18 12:58	
Acrolein	ug/L	ND	50.0	09/05/18 12:58	
Acrylonitrile	ug/L	ND	100	09/05/18 12:58	
Benzene	ug/L	ND	5.0	09/05/18 12:58	
Bromobenzene	ug/L	ND	5.0	09/05/18 12:58	
Bromochloromethane	ug/L	ND	5.0	09/05/18 12:58	
Bromodichloromethane	ug/L	ND	5.0	09/05/18 12:58	
Bromoform	ug/L	ND	5.0	09/05/18 12:58	
Bromomethane	ug/L	ND	5.0	09/05/18 12:58	
Carbon disulfide	ug/L	ND	10.0	09/05/18 12:58	
Carbon tetrachloride	ug/L	ND	5.0	09/05/18 12:58	
Chlorobenzene	ug/L	ND	5.0	09/05/18 12:58	
Chloroethane	ug/L	ND	5.0	09/05/18 12:58	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

METHOD BLANK: 2123026 Matrix: Water

Associated Lab Samples: 50204603001, 50204603002, 50204603003, 50204603004, 50204603005, 50204603006, 50204603007, 50204603008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloroform	ug/L	ND	5.0	09/05/18 12:58	
Chloromethane	ug/L	ND	5.0	09/05/18 12:58	
cis-1,2-Dichloroethene	ug/L	ND	5.0	09/05/18 12:58	
cis-1,3-Dichloropropene	ug/L	ND	5.0	09/05/18 12:58	
Dibromochloromethane	ug/L	ND	5.0	09/05/18 12:58	
Dibromomethane	ug/L	ND	5.0	09/05/18 12:58	
Dichlorodifluoromethane	ug/L	ND	5.0	09/05/18 12:58	
Ethyl methacrylate	ug/L	ND	100	09/05/18 12:58	
Ethylbenzene	ug/L	ND	5.0	09/05/18 12:58	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	09/05/18 12:58	
Iodomethane	ug/L	ND	10.0	09/05/18 12:58	
Isopropylbenzene (Cumene)	ug/L	ND	5.0	09/05/18 12:58	
Methyl-tert-butyl ether	ug/L	ND	4.0	09/05/18 12:58	
Methylene Chloride	ug/L	ND	5.0	09/05/18 12:58	
n-Butylbenzene	ug/L	ND	5.0	09/05/18 12:58	
n-Hexane	ug/L	ND	5.0	09/05/18 12:58	
n-Propylbenzene	ug/L	ND	5.0	09/05/18 12:58	
Naphthalene	ug/L	ND	1.7	09/05/18 12:58	
p-Isopropyltoluene	ug/L	ND	5.0	09/05/18 12:58	
sec-Butylbenzene	ug/L	ND	5.0	09/05/18 12:58	
Styrene	ug/L	ND	5.0	09/05/18 12:58	
tert-Butylbenzene	ug/L	ND	5.0	09/05/18 12:58	
Tetrachloroethene	ug/L	ND	5.0	09/05/18 12:58	
Toluene	ug/L	ND	5.0	09/05/18 12:58	
trans-1,2-Dichloroethene	ug/L	ND	5.0	09/05/18 12:58	
trans-1,3-Dichloropropene	ug/L	ND	5.0	09/05/18 12:58	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	09/05/18 12:58	
Trichloroethene	ug/L	ND	5.0	09/05/18 12:58	
Trichlorofluoromethane	ug/L	ND	5.0	09/05/18 12:58	
Vinyl acetate	ug/L	ND	50.0	09/05/18 12:58	
Vinyl chloride	ug/L	ND	2.0	09/05/18 12:58	
Xylene (Total)	ug/L	ND	10.0	09/05/18 12:58	
4-Bromofluorobenzene (S)	%.	97	85-111	09/05/18 12:58	
Dibromofluoromethane (S)	%.	100	89-116	09/05/18 12:58	
Toluene-d8 (S)	%.	102	87-110	09/05/18 12:58	

LABORATORY CONTROL SAMPLE: 2123027

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	51.0	102	80-120	
1,1,1-Trichloroethane	ug/L	50	49.3	99	74-126	
1,1,2,2-Tetrachloroethane	ug/L	50	48.9	98	73-117	
1,1,2-Trichloroethane	ug/L	50	53.0	106	74-119	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

LABORATORY CONTROL SAMPLE: 2123027

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	50	46.8	94	72-119	
1,1-Dichloroethene	ug/L	50	48.4	97	72-123	
1,1-Dichloropropene	ug/L	50	48.6	97	77-125	
1,2,3-Trichlorobenzene	ug/L	50	50.4	101	74-125	
1,2,3-Trichloropropane	ug/L	50	53.3	107	82-121	
1,2,4-Trichlorobenzene	ug/L	50	49.7	99	70-125	
1,2,4-Trimethylbenzene	ug/L	50	47.6	95	76-118	
1,2-Dibromoethane (EDB)	ug/L	50	51.0	102	80-120	
1,2-Dichlorobenzene	ug/L	50	48.9	98	77-117	
1,2-Dichloroethane	ug/L	50	45.4	91	69-122	
1,2-Dichloropropane	ug/L	50	48.9	98	75-124	
1,3,5-Trimethylbenzene	ug/L	50	47.1	94	75-117	
1,3-Dichlorobenzene	ug/L	50	48.1	96	76-116	
1,3-Dichloropropane	ug/L	50	49.1	98	82-118	
1,4-Dichlorobenzene	ug/L	50	46.8	94	74-115	
1-Methylnaphthalene	ug/L	50	55.7	111	70-130	N2
2,2-Dichloropropane	ug/L	50	49.8	100	51-133	
2-Butanone (MEK)	ug/L	250	251	100	72-147	
2-Chlorotoluene	ug/L	50	48.4	97	73-113	
2-Hexanone	ug/L	250	248	99	71-132	
2-Methylnaphthalene	ug/L	50	53.0	106	69-123	
4-Chlorotoluene	ug/L	50	48.1	96	78-118	
4-Methyl-2-pentanone (MIBK)	ug/L	250	254	102	89-128	
Acetone	ug/L	250	262	105	46-170	
Acrolein	ug/L	1000	1090	109	13-200	
Acrylonitrile	ug/L	200	200	100	65-130	
Benzene	ug/L	50	47.4	95	78-117	
Bromobenzene	ug/L	50	48.4	97	66-126	
Bromochloromethane	ug/L	50	55.7	111	76-120	
Bromodichloromethane	ug/L	50	50.7	101	76-120	
Bromoform	ug/L	50	48.3	97	70-124	
Bromomethane	ug/L	50	58.4	117	29-181	
Carbon disulfide	ug/L	50	47.4	95	66-123	
Carbon tetrachloride	ug/L	50	49.1	98	73-132	
Chlorobenzene	ug/L	50	46.9	94	79-112	
Chloroethane	ug/L	50	50.3	101	59-156	
Chloroform	ug/L	50	47.7	95	76-118	
Chloromethane	ug/L	50	37.9	76	45-142	
cis-1,2-Dichloroethene	ug/L	50	50.6	101	75-117	
cis-1,3-Dichloropropene	ug/L	50	48.8	98	77-120	
Dibromochloromethane	ug/L	50	50.0	100	78-123	
Dibromomethane	ug/L	50	54.7	109	78-122	
Dichlorodifluoromethane	ug/L	50	51.0	102	41-168	
Ethyl methacrylate	ug/L	200	199	100	75-128	
Ethylbenzene	ug/L	50	48.0	96	80-118	
Hexachloro-1,3-butadiene	ug/L	50	54.7	109	73-125	
Iodomethane	ug/L	100	84.1	84	35-174	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

LABORATORY CONTROL SAMPLE: 2123027

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isopropylbenzene (Cumene)	ug/L	50	49.6	99	81-117	
Methyl-tert-butyl ether	ug/L	50	50.3	101	71-124	
Methylene Chloride	ug/L	50	51.3	103	59-136	
n-Butylbenzene	ug/L	50	49.0	98	72-118	
n-Hexane	ug/L	50	51.6	103	60-128	
n-Propylbenzene	ug/L	50	47.2	94	75-120	
Naphthalene	ug/L	50	51.2	102	67-126	
p-Isopropyltoluene	ug/L	50	47.5	95	75-115	
sec-Butylbenzene	ug/L	50	48.0	96	76-120	
Styrene	ug/L	50	48.5	97	74-121	
tert-Butylbenzene	ug/L	50	41.9	84	55-109	
Tetrachloroethene	ug/L	50	47.9	96	76-116	
Toluene	ug/L	50	47.0	94	77-115	
trans-1,2-Dichloroethene	ug/L	50	49.3	99	75-121	
trans-1,3-Dichloropropene	ug/L	50	50.3	101	77-121	
trans-1,4-Dichloro-2-butene	ug/L	200	193	97	42-128	
Trichloroethene	ug/L	50	46.1	92	76-120	
Trichlorofluoromethane	ug/L	50	45.8	92	81-141	
Vinyl acetate	ug/L	200	195	97	67-131	
Vinyl chloride	ug/L	50	45.7	91	64-155	
Xylene (Total)	ug/L	150	152	101	78-118	
4-Bromofluorobenzene (S)	%.			100	85-111	
Dibromofluoromethane (S)	%.			100	89-116	
Toluene-d8 (S)	%.			102	87-110	

MATRIX SPIKE SAMPLE: 2123028

Parameter	Units	50204603001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	50	35.8	72	48-138	
1,1,1-Trichloroethane	ug/L	ND	50	36.0	72	50-141	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	34.5	69	52-131	
1,1,2-Trichloroethane	ug/L	ND	50	36.8	74	53-131	
1,1-Dichloroethane	ug/L	ND	50	33.8	68	51-130	
1,1-Dichloroethene	ug/L	ND	50	35.7	71	51-138	
1,1-Dichloropropene	ug/L	ND	50	36.2	72	47-143	
1,2,3-Trichlorobenzene	ug/L	ND	50	34.1	68	26-143	
1,2,3-Trichloropropane	ug/L	ND	50	36.3	73	60-136	
1,2,4-Trichlorobenzene	ug/L	ND	50	32.8	66	20-142	
1,2,4-Trimethylbenzene	ug/L	ND	50	34.1	68	19-148	
1,2-Dibromoethane (EDB)	ug/L	ND	50	36.1	72	57-134	
1,2-Dichlorobenzene	ug/L	ND	50	34.5	69	30-142	
1,2-Dichloroethane	ug/L	ND	50	32.0	64	46-139	
1,2-Dichloropropane	ug/L	ND	50	36.4	73	54-135	
1,3,5-Trimethylbenzene	ug/L	ND	50	33.6	67	16-149	
1,3-Dichlorobenzene	ug/L	ND	50	34.0	68	24-142	

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

MATRIX SPIKE SAMPLE: 2123028

Parameter	Units	50204603001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,3-Dichloropropane	ug/L	ND	50	35.1	70	59-134	
1,4-Dichlorobenzene	ug/L	ND	50	32.8	66	24-140	
1-Methylnaphthalene	ug/L	ND	50	36.1	72	44-135	N2
2,2-Dichloropropane	ug/L	ND	50	31.7	63	24-138	
2-Butanone (MEK)	ug/L	ND	250	177	71	49-156	
2-Chlorotoluene	ug/L	ND	50	34.5	69	21-143	
2-Hexanone	ug/L	ND	250	171	68	53-140	
2-Methylnaphthalene	ug/L	ND	50	34.1	68	33-137	
4-Chlorotoluene	ug/L	ND	50	34.7	69	23-147	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	177	71	50-139	
Acetone	ug/L	ND	250	187	75	34-160	
Acrolein	ug/L	ND	1000	692	69	30-178	
Acrylonitrile	ug/L	ND	200	142	71	54-136	
Benzene	ug/L	ND	50	35.6	71	50-135	
Bromobenzene	ug/L	ND	50	34.7	69	28-147	
Bromochloromethane	ug/L	ND	50	42.6	85	54-138	
Bromodichloromethane	ug/L	ND	50	35.8	72	50-135	
Bromoform	ug/L	ND	50	33.6	67	43-133	
Bromomethane	ug/L	ND	50	26.0	52	15-170	
Carbon disulfide	ug/L	ND	50	34.3	69	36-139	
Carbon tetrachloride	ug/L	ND	50	36.4	73	43-151	
Chlorobenzene	ug/L	ND	50	34.6	69	39-135	
Chloroethane	ug/L	ND	50	38.1	76	42-165	
Chloroform	ug/L	ND	50	34.5	69	52-134	
Chloromethane	ug/L	ND	50	24.4	49	33-146	
cis-1,2-Dichloroethene	ug/L	ND	50	35.9	72	48-133	
cis-1,3-Dichloropropene	ug/L	ND	50	35.0	70	46-131	
Dibromochloromethane	ug/L	ND	50	35.1	70	50-139	
Dibromomethane	ug/L	ND	50	38.9	78	55-137	
Dichlorodifluoromethane	ug/L	ND	50	36.9	74	29-178	
Ethyl methacrylate	ug/L	ND	200	145	73	58-136	
Ethylbenzene	ug/L	ND	50	35.1	70	31-147	
Hexachloro-1,3-butadiene	ug/L	ND	50	34.9	70	10-158	
Iodomethane	ug/L	ND	100	35.7	36	17-173	
Isopropylbenzene (Cumene)	ug/L	ND	50	36.0	72	25-151	
Methyl-tert-butyl ether	ug/L	ND	50	35.4	71	51-142	
Methylene Chloride	ug/L	ND	50	34.5	69	41-142	
n-Butylbenzene	ug/L	ND	50	33.1	66	10-153	
n-Hexane	ug/L	ND	50	35.0	70	35-141	
n-Propylbenzene	ug/L	ND	50	35.8	72	16-153	
Naphthalene	ug/L	ND	50	36.0	72	40-135	
p-Isopropyltoluene	ug/L	ND	50	33.9	68	11-150	
sec-Butylbenzene	ug/L	ND	50	34.5	69	11-157	
Styrene	ug/L	ND	50	35.5	71	28-142	
tert-Butylbenzene	ug/L	ND	50	30.6	61	11-132	
Tetrachloroethene	ug/L	ND	50	33.4	67	34-140	
Toluene	ug/L	ND	50	33.7	67	43-134	

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Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

MATRIX SPIKE SAMPLE: 2123028

Parameter	Units	50204603001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
trans-1,2-Dichloroethene	ug/L	ND	50	35.8	72	51-135	
trans-1,3-Dichloropropene	ug/L	ND	50	34.6	69	44-133	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	132	66	12-138	
Trichloroethene	ug/L	ND	50	34.4	69	40-141	
Trichlorofluoromethane	ug/L	ND	50	34.8	70	56-162	
Vinyl acetate	ug/L	ND	200	124	62	11-134	
Vinyl chloride	ug/L	ND	50	34.0	68	46-164	
Xylene (Total)	ug/L	ND	150	109	73	29-145	
4-Bromofluorobenzene (S)	%.				101	85-111	
Dibromofluoromethane (S)	%.				100	89-116	
Toluene-d8 (S)	%.				102	87-110	

SAMPLE DUPLICATE: 2123029

Parameter	Units	50204603001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		20	
1,1,1-Trichloroethane	ug/L	ND	ND		20	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		20	
1,1,2-Trichloroethane	ug/L	ND	ND		20	
1,1-Dichloroethane	ug/L	ND	ND		20	
1,1-Dichloroethene	ug/L	ND	ND		20	
1,1-Dichloropropene	ug/L	ND	ND		20	
1,2,3-Trichlorobenzene	ug/L	ND	ND		20	
1,2,3-Trichloropropane	ug/L	ND	ND		20	
1,2,4-Trichlorobenzene	ug/L	ND	ND		20	
1,2,4-Trimethylbenzene	ug/L	ND	ND		20	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		20	
1,2-Dichlorobenzene	ug/L	ND	ND		20	
1,2-Dichloroethane	ug/L	ND	ND		20	
1,2-Dichloropropane	ug/L	ND	ND		20	
1,3,5-Trimethylbenzene	ug/L	ND	ND		20	
1,3-Dichlorobenzene	ug/L	ND	ND		20	
1,3-Dichloropropane	ug/L	ND	ND		20	
1,4-Dichlorobenzene	ug/L	ND	ND		20	
1-Methylnaphthalene	ug/L	ND	ND		20	N2
2,2-Dichloropropane	ug/L	ND	ND		20	
2-Butanone (MEK)	ug/L	ND	ND		20	
2-Chlorotoluene	ug/L	ND	ND		20	
2-Hexanone	ug/L	ND	ND		20	
2-Methylnaphthalene	ug/L	ND	ND		20	
4-Chlorotoluene	ug/L	ND	ND		20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		20	
Acetone	ug/L	ND	ND		20	
Acrolein	ug/L	ND	ND		20	
Acrylonitrile	ug/L	ND	ND		20	

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Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

SAMPLE DUPLICATE: 2123029

Parameter	Units	50204603001 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzene	ug/L	ND	ND		20	
Bromobenzene	ug/L	ND	ND		20	
Bromochloromethane	ug/L	ND	ND		20	
Bromodichloromethane	ug/L	ND	ND		20	
Bromoform	ug/L	ND	ND		20	
Bromomethane	ug/L	ND	ND		20	
Carbon disulfide	ug/L	ND	ND		20	
Carbon tetrachloride	ug/L	ND	ND		20	
Chlorobenzene	ug/L	ND	ND		20	
Chloroethane	ug/L	ND	ND		20	
Chloroform	ug/L	ND	ND		20	
Chloromethane	ug/L	ND	ND		20	
cis-1,2-Dichloroethene	ug/L	ND	ND		20	
cis-1,3-Dichloropropene	ug/L	ND	ND		20	
Dibromochloromethane	ug/L	ND	ND		20	
Dibromomethane	ug/L	ND	ND		20	
Dichlorodifluoromethane	ug/L	ND	ND		20	
Ethyl methacrylate	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	ND		20	
Hexachloro-1,3-butadiene	ug/L	ND	ND		20	
Iodomethane	ug/L	ND	ND		20	
Isopropylbenzene (Cumene)	ug/L	ND	ND		20	
Methyl-tert-butyl ether	ug/L	ND	ND		20	
Methylene Chloride	ug/L	ND	ND		20	
n-Butylbenzene	ug/L	ND	ND		20	
n-Hexane	ug/L	ND	ND		20	
n-Propylbenzene	ug/L	ND	ND		20	
Naphthalene	ug/L	ND	ND		20	
p-Isopropyltoluene	ug/L	ND	ND		20	
sec-Butylbenzene	ug/L	ND	ND		20	
Styrene	ug/L	ND	ND		20	
tert-Butylbenzene	ug/L	ND	ND		20	
Tetrachloroethene	ug/L	ND	ND		20	
Toluene	ug/L	ND	ND		20	
trans-1,2-Dichloroethene	ug/L	ND	ND		20	
trans-1,3-Dichloropropene	ug/L	ND	ND		20	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		20	
Trichloroethene	ug/L	ND	ND		20	
Trichlorofluoromethane	ug/L	ND	ND		20	
Vinyl acetate	ug/L	ND	ND		20	
Vinyl chloride	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
4-Bromofluorobenzene (S)	%.	102	101	1		
Dibromofluoromethane (S)	%.	99	100	1		
Toluene-d8 (S)	%.	104	102	3		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

QC Batch: 460082 Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50204603009, 50204603010, 50204603011, 50204603012, 50204603013, 50204603014, 50204603015, 50204603016, 50204603017, 50204603018, 50204603019, 50204603020, 50204603021, 50204603022, 50204603023, 50204603024, 50204603025, 50204603026, 50204603027, 50204603028

METHOD BLANK: 2123030 Matrix: Water
Associated Lab Samples: 50204603009, 50204603010, 50204603011, 50204603012, 50204603013, 50204603014, 50204603015, 50204603016, 50204603017, 50204603018, 50204603019, 50204603020, 50204603021, 50204603022, 50204603023, 50204603024, 50204603025, 50204603026, 50204603027, 50204603028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	09/05/18 23:34	
1,1,1-Trichloroethane	ug/L	ND	5.0	09/05/18 23:34	
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	09/05/18 23:34	
1,1,2-Trichloroethane	ug/L	ND	5.0	09/05/18 23:34	
1,1-Dichloroethane	ug/L	ND	5.0	09/05/18 23:34	
1,1-Dichloroethene	ug/L	ND	5.0	09/05/18 23:34	
1,1-Dichloropropene	ug/L	ND	5.0	09/05/18 23:34	
1,2,3-Trichlorobenzene	ug/L	ND	5.0	09/05/18 23:34	
1,2,3-Trichloropropane	ug/L	ND	5.0	09/05/18 23:34	
1,2,4-Trichlorobenzene	ug/L	ND	5.0	09/05/18 23:34	
1,2,4-Trimethylbenzene	ug/L	ND	5.0	09/05/18 23:34	
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	09/05/18 23:34	
1,2-Dichlorobenzene	ug/L	ND	5.0	09/05/18 23:34	
1,2-Dichloroethane	ug/L	ND	5.0	09/05/18 23:34	
1,2-Dichloropropane	ug/L	ND	5.0	09/05/18 23:34	
1,3,5-Trimethylbenzene	ug/L	ND	5.0	09/05/18 23:34	
1,3-Dichlorobenzene	ug/L	ND	5.0	09/05/18 23:34	
1,3-Dichloropropane	ug/L	ND	5.0	09/05/18 23:34	
1,4-Dichlorobenzene	ug/L	ND	5.0	09/05/18 23:34	
1-Methylnaphthalene	ug/L	ND	10.0	09/05/18 23:34	N2
2,2-Dichloropropane	ug/L	ND	5.0	09/05/18 23:34	
2-Butanone (MEK)	ug/L	ND	25.0	09/05/18 23:34	
2-Chlorotoluene	ug/L	ND	5.0	09/05/18 23:34	
2-Hexanone	ug/L	ND	25.0	09/05/18 23:34	
2-Methylnaphthalene	ug/L	ND	10.0	09/05/18 23:34	
4-Chlorotoluene	ug/L	ND	5.0	09/05/18 23:34	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	09/05/18 23:34	
Acetone	ug/L	ND	100	09/05/18 23:34	
Acrolein	ug/L	ND	50.0	09/05/18 23:34	
Acrylonitrile	ug/L	ND	100	09/05/18 23:34	
Benzene	ug/L	ND	5.0	09/05/18 23:34	
Bromobenzene	ug/L	ND	5.0	09/05/18 23:34	
Bromochloromethane	ug/L	ND	5.0	09/05/18 23:34	
Bromodichloromethane	ug/L	ND	5.0	09/05/18 23:34	
Bromoform	ug/L	ND	5.0	09/05/18 23:34	
Bromomethane	ug/L	ND	5.0	09/05/18 23:34	
Carbon disulfide	ug/L	ND	10.0	09/05/18 23:34	
Carbon tetrachloride	ug/L	ND	5.0	09/05/18 23:34	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

METHOD BLANK: 2123030 Matrix: Water

Associated Lab Samples: 50204603009, 50204603010, 50204603011, 50204603012, 50204603013, 50204603014, 50204603015, 50204603016, 50204603017, 50204603018, 50204603019, 50204603020, 50204603021, 50204603022, 50204603023, 50204603024, 50204603025, 50204603026, 50204603027, 50204603028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chlorobenzene	ug/L	ND	5.0	09/05/18 23:34	
Chloroethane	ug/L	ND	5.0	09/05/18 23:34	
Chloroform	ug/L	ND	5.0	09/05/18 23:34	
Chloromethane	ug/L	ND	5.0	09/05/18 23:34	
cis-1,2-Dichloroethene	ug/L	ND	5.0	09/05/18 23:34	
cis-1,3-Dichloropropene	ug/L	ND	5.0	09/05/18 23:34	
Dibromochloromethane	ug/L	ND	5.0	09/05/18 23:34	
Dibromomethane	ug/L	ND	5.0	09/05/18 23:34	
Dichlorodifluoromethane	ug/L	ND	5.0	09/05/18 23:34	
Ethyl methacrylate	ug/L	ND	100	09/05/18 23:34	
Ethylbenzene	ug/L	ND	5.0	09/05/18 23:34	
Hexachloro-1,3-butadiene	ug/L	ND	5.0	09/05/18 23:34	
Iodomethane	ug/L	ND	10.0	09/05/18 23:34	
Isopropylbenzene (Cumene)	ug/L	ND	5.0	09/05/18 23:34	
Methyl-tert-butyl ether	ug/L	ND	4.0	09/05/18 23:34	
Methylene Chloride	ug/L	ND	5.0	09/05/18 23:34	
n-Butylbenzene	ug/L	ND	5.0	09/05/18 23:34	
n-Hexane	ug/L	ND	5.0	09/05/18 23:34	
n-Propylbenzene	ug/L	ND	5.0	09/05/18 23:34	
Naphthalene	ug/L	ND	1.7	09/05/18 23:34	
p-Isopropyltoluene	ug/L	ND	5.0	09/05/18 23:34	
sec-Butylbenzene	ug/L	ND	5.0	09/05/18 23:34	
Styrene	ug/L	ND	5.0	09/05/18 23:34	
tert-Butylbenzene	ug/L	ND	5.0	09/05/18 23:34	
Tetrachloroethene	ug/L	ND	5.0	09/05/18 23:34	
Toluene	ug/L	ND	5.0	09/05/18 23:34	
trans-1,2-Dichloroethene	ug/L	ND	5.0	09/05/18 23:34	
trans-1,3-Dichloropropene	ug/L	ND	5.0	09/05/18 23:34	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	09/05/18 23:34	
Trichloroethene	ug/L	ND	5.0	09/05/18 23:34	
Trichlorofluoromethane	ug/L	ND	5.0	09/05/18 23:34	
Vinyl acetate	ug/L	ND	50.0	09/05/18 23:34	
Vinyl chloride	ug/L	ND	2.0	09/05/18 23:34	
Xylene (Total)	ug/L	ND	10.0	09/05/18 23:34	
4-Bromofluorobenzene (S)	%.	102	85-111	09/05/18 23:34	
Dibromofluoromethane (S)	%.	98	89-116	09/05/18 23:34	
Toluene-d8 (S)	%.	101	87-110	09/05/18 23:34	

LABORATORY CONTROL SAMPLE: 2123031

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	52.4	105	80-120	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

LABORATORY CONTROL SAMPLE: 2123031

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	50.2	100	74-126	
1,1,2,2-Tetrachloroethane	ug/L	50	48.8	98	73-117	
1,1,2-Trichloroethane	ug/L	50	53.9	108	74-119	
1,1-Dichloroethane	ug/L	50	47.1	94	72-119	
1,1-Dichloroethene	ug/L	50	48.7	97	72-123	
1,1-Dichloropropene	ug/L	50	49.3	99	77-125	
1,2,3-Trichlorobenzene	ug/L	50	51.1	102	74-125	
1,2,3-Trichloropropane	ug/L	50	51.1	102	82-121	
1,2,4-Trichlorobenzene	ug/L	50	50.0	100	70-125	
1,2,4-Trimethylbenzene	ug/L	50	47.4	95	76-118	
1,2-Dibromoethane (EDB)	ug/L	50	52.0	104	80-120	
1,2-Dichlorobenzene	ug/L	50	49.0	98	77-117	
1,2-Dichloroethane	ug/L	50	45.4	91	69-122	
1,2-Dichloropropane	ug/L	50	51.0	102	75-124	
1,3,5-Trimethylbenzene	ug/L	50	47.0	94	75-117	
1,3-Dichlorobenzene	ug/L	50	48.3	97	76-116	
1,3-Dichloropropane	ug/L	50	49.9	100	82-118	
1,4-Dichlorobenzene	ug/L	50	46.5	93	74-115	
1-Methylnaphthalene	ug/L	50	54.6	109	70-130	N2
2,2-Dichloropropane	ug/L	50	40.3	81	51-133	
2-Butanone (MEK)	ug/L	250	268	107	72-147	
2-Chlorotoluene	ug/L	50	48.2	96	73-113	
2-Hexanone	ug/L	250	258	103	71-132	
2-Methylnaphthalene	ug/L	50	53.0	106	69-123	
4-Chlorotoluene	ug/L	50	48.7	97	78-118	
4-Methyl-2-pentanone (MIBK)	ug/L	250	256	103	89-128	
Acetone	ug/L	250	271	109	46-170	
Acrolein	ug/L	1000	1040	104	13-200	
Acrylonitrile	ug/L	200	202	101	65-130	
Benzene	ug/L	50	47.1	94	78-117	
Bromobenzene	ug/L	50	49.8	100	66-126	
Bromochloromethane	ug/L	50	57.6	115	76-120	
Bromodichloromethane	ug/L	50	50.7	101	76-120	
Bromoform	ug/L	50	49.2	98	70-124	
Bromomethane	ug/L	50	49.3	99	29-181	
Carbon disulfide	ug/L	50	47.3	95	66-123	
Carbon tetrachloride	ug/L	50	49.5	99	73-132	
Chlorobenzene	ug/L	50	48.5	97	79-112	
Chloroethane	ug/L	50	51.8	104	59-156	
Chloroform	ug/L	50	49.1	98	76-118	
Chloromethane	ug/L	50	35.2	70	45-142	
cis-1,2-Dichloroethene	ug/L	50	50.3	101	75-117	
cis-1,3-Dichloropropene	ug/L	50	50.1	100	77-120	
Dibromochloromethane	ug/L	50	51.5	103	78-123	
Dibromomethane	ug/L	50	53.4	107	78-122	
Dichlorodifluoromethane	ug/L	50	51.4	103	41-168	
Ethyl methacrylate	ug/L	200	203	101	75-128	

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REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

LABORATORY CONTROL SAMPLE: 2123031

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	49.1	98	80-118	
Hexachloro-1,3-butadiene	ug/L	50	53.4	107	73-125	
Iodomethane	ug/L	100	75.3	75	35-174	
Isopropylbenzene (Cumene)	ug/L	50	50.3	101	81-117	
Methyl-tert-butyl ether	ug/L	50	51.3	103	71-124	
Methylene Chloride	ug/L	50	51.3	103	59-136	
n-Butylbenzene	ug/L	50	47.9	96	72-118	
n-Hexane	ug/L	50	46.3	93	60-128	
n-Propylbenzene	ug/L	50	47.3	95	75-120	
Naphthalene	ug/L	50	51.7	103	67-126	
p-Isopropyltoluene	ug/L	50	48.3	97	75-115	
sec-Butylbenzene	ug/L	50	48.4	97	76-120	
Styrene	ug/L	50	49.8	100	74-121	
tert-Butylbenzene	ug/L	50	42.6	85	55-109	
Tetrachloroethene	ug/L	50	48.5	97	76-116	
Toluene	ug/L	50	47.2	94	77-115	
trans-1,2-Dichloroethene	ug/L	50	48.9	98	75-121	
trans-1,3-Dichloropropene	ug/L	50	48.6	97	77-121	
trans-1,4-Dichloro-2-butene	ug/L	200	190	95	42-128	
Trichloroethene	ug/L	50	48.1	96	76-120	
Trichlorofluoromethane	ug/L	50	46.8	94	81-141	
Vinyl acetate	ug/L	200	195	97	67-131	
Vinyl chloride	ug/L	50	46.7	93	64-155	
Xylene (Total)	ug/L	150	155	103	78-118	
4-Bromofluorobenzene (S)	%.			103	85-111	
Dibromofluoromethane (S)	%.			101	89-116	
Toluene-d8 (S)	%.			101	87-110	

MATRIX SPIKE SAMPLE: 2123032

Parameter	Units	50204603022 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	50	49.8	100	48-138	
1,1,1-Trichloroethane	ug/L	ND	50	51.4	103	50-141	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	45.1	90	52-131	
1,1,2-Trichloroethane	ug/L	ND	50	49.8	100	53-131	
1,1-Dichloroethane	ug/L	ND	50	45.7	91	51-130	
1,1-Dichloroethene	ug/L	ND	50	47.6	95	51-138	
1,1-Dichloropropene	ug/L	ND	50	48.8	98	47-143	
1,2,3-Trichlorobenzene	ug/L	ND	50	45.6	91	26-143	
1,2,3-Trichloropropane	ug/L	ND	50	48.2	96	60-136	
1,2,4-Trichlorobenzene	ug/L	ND	50	44.7	89	20-142	
1,2,4-Trimethylbenzene	ug/L	ND	50	44.8	90	19-148	
1,2-Dibromoethane (EDB)	ug/L	ND	50	48.4	97	57-134	
1,2-Dichlorobenzene	ug/L	ND	50	45.9	92	30-142	
1,2-Dichloroethane	ug/L	ND	50	43.1	86	46-139	

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Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

MATRIX SPIKE SAMPLE: 2123032

Parameter	Units	50204603022 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,2-Dichloropropane	ug/L	ND	50	49.0	98	54-135	
1,3,5-Trimethylbenzene	ug/L	ND	50	44.3	89	16-149	
1,3-Dichlorobenzene	ug/L	ND	50	45.3	91	24-142	
1,3-Dichloropropane	ug/L	ND	50	48.1	96	59-134	
1,4-Dichlorobenzene	ug/L	ND	50	43.6	87	24-140	
1-Methylnaphthalene	ug/L	ND	50	46.1	92	44-135	N2
2,2-Dichloropropane	ug/L	ND	50	31.8	64	24-138	
2-Butanone (MEK)	ug/L	ND	250	231	93	49-156	
2-Chlorotoluene	ug/L	ND	50	46.1	92	21-143	
2-Hexanone	ug/L	ND	250	226	90	53-140	
2-Methylnaphthalene	ug/L	ND	50	45.6	91	33-137	
4-Chlorotoluene	ug/L	ND	50	45.3	91	23-147	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	250	231	92	50-139	
Acetone	ug/L	ND	250	242	97	34-160	
Acrolein	ug/L	ND	1000	762	76	30-178	
Acrylonitrile	ug/L	ND	200	180	90	54-136	
Benzene	ug/L	ND	50	45.9	92	50-135	
Bromobenzene	ug/L	ND	50	46.2	92	28-147	
Bromochloromethane	ug/L	ND	50	56.8	114	54-138	
Bromodichloromethane	ug/L	ND	50	49.2	98	50-135	
Bromoform	ug/L	ND	50	44.7	89	43-133	
Bromomethane	ug/L	ND	50	51.6	103	15-170	
Carbon disulfide	ug/L	ND	50	45.6	91	36-139	
Carbon tetrachloride	ug/L	ND	50	49.3	99	43-151	
Chlorobenzene	ug/L	ND	50	45.8	92	39-135	
Chloroethane	ug/L	ND	50	49.2	98	42-165	
Chloroform	ug/L	ND	50	46.9	94	52-134	
Chloromethane	ug/L	ND	50	34.3	69	33-146	
cis-1,2-Dichloroethene	ug/L	ND	50	48.0	96	48-133	
cis-1,3-Dichloropropene	ug/L	ND	50	43.2	86	46-131	
Dibromochloromethane	ug/L	ND	50	48.7	97	50-139	
Dibromomethane	ug/L	ND	50	52.8	106	55-137	
Dichlorodifluoromethane	ug/L	ND	50	49.6	99	29-178	
Ethyl methacrylate	ug/L	ND	200	191	96	58-136	
Ethylbenzene	ug/L	ND	50	47.2	94	31-147	
Hexachloro-1,3-butadiene	ug/L	ND	50	46.8	94	10-158	
Iodomethane	ug/L	ND	100	59.9	60	17-173	
Isopropylbenzene (Cumene)	ug/L	ND	50	48.2	96	25-151	
Methyl-tert-butyl ether	ug/L	ND	50	47.3	95	51-142	
Methylene Chloride	ug/L	ND	50	46.4	93	41-142	
n-Butylbenzene	ug/L	ND	50	43.1	86	10-153	
n-Hexane	ug/L	ND	50	41.4	83	35-141	
n-Propylbenzene	ug/L	ND	50	44.9	90	16-153	
Naphthalene	ug/L	ND	50	46.2	92	40-135	
p-Isopropyltoluene	ug/L	ND	50	44.8	90	11-150	
sec-Butylbenzene	ug/L	ND	50	45.8	92	11-157	
Styrene	ug/L	ND	50	46.9	94	28-142	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical
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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

MATRIX SPIKE SAMPLE: 2123032

Parameter	Units	50204603022 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
tert-Butylbenzene	ug/L	ND	50	40.7	81	11-132	
Tetrachloroethene	ug/L	12.8	50	60.9	96	34-140	
Toluene	ug/L	ND	50	46.0	92	43-134	
trans-1,2-Dichloroethene	ug/L	ND	50	47.5	95	51-135	
trans-1,3-Dichloropropene	ug/L	ND	50	43.1	86	44-133	
trans-1,4-Dichloro-2-butene	ug/L	ND	200	165	82	12-138	
Trichloroethene	ug/L	ND	50	45.9	92	40-141	
Trichlorofluoromethane	ug/L	ND	50	47.2	94	56-162	
Vinyl acetate	ug/L	ND	200	105	53	11-134	
Vinyl chloride	ug/L	ND	50	47.4	95	46-164	
Xylene (Total)	ug/L	ND	150	148	99	29-145	
4-Bromofluorobenzene (S)	%.				104	85-111	
Dibromofluoromethane (S)	%.				99	89-116	
Toluene-d8 (S)	%.				99	87-110	

SAMPLE DUPLICATE: 2123033

Parameter	Units	50204603023 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		20	
1,1,1-Trichloroethane	ug/L	ND	ND		20	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		20	
1,1,2-Trichloroethane	ug/L	ND	ND		20	
1,1-Dichloroethane	ug/L	ND	ND		20	
1,1-Dichloroethene	ug/L	ND	ND		20	
1,1-Dichloropropene	ug/L	ND	ND		20	
1,2,3-Trichlorobenzene	ug/L	ND	ND		20	
1,2,3-Trichloropropane	ug/L	ND	ND		20	
1,2,4-Trichlorobenzene	ug/L	ND	ND		20	
1,2,4-Trimethylbenzene	ug/L	ND	ND		20	
1,2-Dibromoethane (EDB)	ug/L	ND	ND		20	
1,2-Dichlorobenzene	ug/L	ND	ND		20	
1,2-Dichloroethane	ug/L	ND	ND		20	
1,2-Dichloropropane	ug/L	ND	ND		20	
1,3,5-Trimethylbenzene	ug/L	ND	ND		20	
1,3-Dichlorobenzene	ug/L	ND	ND		20	
1,3-Dichloropropane	ug/L	ND	ND		20	
1,4-Dichlorobenzene	ug/L	ND	ND		20	
1-Methylnaphthalene	ug/L	ND	ND		20	N2
2,2-Dichloropropane	ug/L	ND	ND		20	
2-Butanone (MEK)	ug/L	ND	ND		20	
2-Chlorotoluene	ug/L	ND	ND		20	
2-Hexanone	ug/L	ND	ND		20	
2-Methylnaphthalene	ug/L	ND	ND		20	
4-Chlorotoluene	ug/L	ND	ND		20	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
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(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

SAMPLE DUPLICATE: 2123033

Parameter	Units	50204603023 Result	Dup Result	RPD	Max RPD	Qualifiers
Acetone	ug/L	ND	ND		20	
Acrolein	ug/L	ND	ND		20	
Acrylonitrile	ug/L	ND	ND		20	
Benzene	ug/L	ND	ND		20	
Bromobenzene	ug/L	ND	ND		20	
Bromochloromethane	ug/L	ND	ND		20	
Bromodichloromethane	ug/L	ND	ND		20	
Bromoform	ug/L	ND	ND		20	
Bromomethane	ug/L	ND	ND		20	
Carbon disulfide	ug/L	ND	ND		20	
Carbon tetrachloride	ug/L	ND	ND		20	
Chlorobenzene	ug/L	ND	ND		20	
Chloroethane	ug/L	ND	ND		20	
Chloroform	ug/L	ND	ND		20	
Chloromethane	ug/L	ND	ND		20	
cis-1,2-Dichloroethene	ug/L	ND	ND		20	
cis-1,3-Dichloropropene	ug/L	ND	ND		20	
Dibromochloromethane	ug/L	ND	ND		20	
Dibromomethane	ug/L	ND	ND		20	
Dichlorodifluoromethane	ug/L	ND	ND		20	
Ethyl methacrylate	ug/L	ND	ND		20	
Ethylbenzene	ug/L	ND	ND		20	
Hexachloro-1,3-butadiene	ug/L	ND	ND		20	
Iodomethane	ug/L	ND	ND		20	
Isopropylbenzene (Cumene)	ug/L	ND	ND		20	
Methyl-tert-butyl ether	ug/L	ND	ND		20	
Methylene Chloride	ug/L	ND	ND		20	
n-Butylbenzene	ug/L	ND	ND		20	
n-Hexane	ug/L	ND	ND		20	
n-Propylbenzene	ug/L	ND	ND		20	
Naphthalene	ug/L	ND	ND		20	
p-Isopropyltoluene	ug/L	ND	ND		20	
sec-Butylbenzene	ug/L	ND	ND		20	
Styrene	ug/L	ND	ND		20	
tert-Butylbenzene	ug/L	ND	ND		20	
Tetrachloroethene	ug/L	100	107	7	20	
Toluene	ug/L	ND	ND		20	
trans-1,2-Dichloroethene	ug/L	ND	ND		20	
trans-1,3-Dichloropropene	ug/L	ND	ND		20	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		20	
Trichloroethene	ug/L	ND	ND		20	
Trichlorofluoromethane	ug/L	ND	ND		20	
Vinyl acetate	ug/L	ND	ND		20	
Vinyl chloride	ug/L	ND	ND		20	
Xylene (Total)	ug/L	ND	ND		20	
4-Bromofluorobenzene (S)	%.	99	100	1		
Dibromofluoromethane (S)	%.	97	97	0		

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

SAMPLE DUPLICATE: 2123033

Parameter	Units	50204603023 Result	Dup Result	RPD	Max RPD	Qualifiers
Toluene-d8 (S)	%.	98	100	2		

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

QC Batch: 460612 Analysis Method: EPA 5030/8260
QC Batch Method: EPA 5030/8260 Analysis Description: 8260 MSV
Associated Lab Samples: 50204603029, 50204603030, 50204603031, 50204603032, 50204603033, 50204603034, 50204603035, 50204603036

METHOD BLANK: 2125809 Matrix: Water
Associated Lab Samples: 50204603029, 50204603030, 50204603031, 50204603032, 50204603033, 50204603034, 50204603035, 50204603036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	09/06/18 14:15	M5
1,1,1-Trichloroethane	ug/L	ND	5.0	09/06/18 14:15	M5
1,1,2,2-Tetrachloroethane	ug/L	ND	5.0	09/06/18 14:15	M5
1,1,2-Trichloroethane	ug/L	ND	5.0	09/06/18 14:15	M5
1,1-Dichloroethane	ug/L	ND	5.0	09/06/18 14:15	M5
1,1-Dichloroethene	ug/L	ND	5.0	09/06/18 14:15	M5
1,1-Dichloropropene	ug/L	ND	5.0	09/06/18 14:15	M5
1,2,3-Trichlorobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1,2,3-Trichloropropane	ug/L	ND	5.0	09/06/18 14:15	M5
1,2,4-Trichlorobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1,2,4-Trimethylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1,2-Dibromoethane (EDB)	ug/L	ND	5.0	09/06/18 14:15	M5
1,2-Dichlorobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1,2-Dichloroethane	ug/L	ND	5.0	09/06/18 14:15	M5
1,2-Dichloropropane	ug/L	ND	5.0	09/06/18 14:15	M5
1,3,5-Trimethylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1,3-Dichlorobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1,3-Dichloropropane	ug/L	ND	5.0	09/06/18 14:15	M5
1,4-Dichlorobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
1-Methylnaphthalene	ug/L	ND	10.0	09/06/18 14:15	M5,N2
2,2-Dichloropropane	ug/L	ND	5.0	09/06/18 14:15	M5
2-Butanone (MEK)	ug/L	ND	25.0	09/06/18 14:15	M5
2-Chlorotoluene	ug/L	ND	5.0	09/06/18 14:15	M5
2-Hexanone	ug/L	ND	25.0	09/06/18 14:15	M5
2-Methylnaphthalene	ug/L	ND	10.0	09/06/18 14:15	M5
4-Chlorotoluene	ug/L	ND	5.0	09/06/18 14:15	M5
4-Methyl-2-pentanone (MIBK)	ug/L	ND	25.0	09/06/18 14:15	M5
Acetone	ug/L	ND	100	09/06/18 14:15	M5
Acrolein	ug/L	ND	50.0	09/06/18 14:15	M5
Acrylonitrile	ug/L	ND	100	09/06/18 14:15	M5
Benzene	ug/L	ND	5.0	09/06/18 14:15	M5
Bromobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
Bromochloromethane	ug/L	ND	5.0	09/06/18 14:15	M5
Bromodichloromethane	ug/L	ND	5.0	09/06/18 14:15	M5
Bromoform	ug/L	ND	5.0	09/06/18 14:15	M5
Bromomethane	ug/L	ND	5.0	09/06/18 14:15	M5
Carbon disulfide	ug/L	ND	10.0	09/06/18 14:15	M5
Carbon tetrachloride	ug/L	ND	5.0	09/06/18 14:15	M5
Chlorobenzene	ug/L	ND	5.0	09/06/18 14:15	M5
Chloroethane	ug/L	ND	5.0	09/06/18 14:15	M5

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

METHOD BLANK: 2125809 Matrix: Water

Associated Lab Samples: 50204603029, 50204603030, 50204603031, 50204603032, 50204603033, 50204603034, 50204603035, 50204603036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloroform	ug/L	ND	5.0	09/06/18 14:15	M5
Chloromethane	ug/L	ND	5.0	09/06/18 14:15	M5
cis-1,2-Dichloroethene	ug/L	ND	5.0	09/06/18 14:15	M5
cis-1,3-Dichloropropene	ug/L	ND	5.0	09/06/18 14:15	M5
Dibromochloromethane	ug/L	ND	5.0	09/06/18 14:15	M5
Dibromomethane	ug/L	ND	5.0	09/06/18 14:15	M5
Dichlorodifluoromethane	ug/L	ND	5.0	09/06/18 14:15	M5
Ethyl methacrylate	ug/L	ND	100	09/06/18 14:15	M5
Ethylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
Hexachloro-1,3-butadiene	ug/L	ND	5.0	09/06/18 14:15	M5
Iodomethane	ug/L	ND	10.0	09/06/18 14:15	M5
Isopropylbenzene (Cumene)	ug/L	ND	5.0	09/06/18 14:15	M5
Methyl-tert-butyl ether	ug/L	ND	4.0	09/06/18 14:15	M5
Methylene Chloride	ug/L	ND	5.0	09/06/18 14:15	M5
n-Butylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
n-Hexane	ug/L	ND	5.0	09/06/18 14:15	M5
n-Propylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
Naphthalene	ug/L	ND	1.7	09/06/18 14:15	M5
p-Isopropyltoluene	ug/L	ND	5.0	09/06/18 14:15	M5
sec-Butylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
Styrene	ug/L	ND	5.0	09/06/18 14:15	M5
tert-Butylbenzene	ug/L	ND	5.0	09/06/18 14:15	M5
Tetrachloroethene	ug/L	ND	5.0	09/06/18 14:15	M5
Toluene	ug/L	ND	5.0	09/06/18 14:15	M5
trans-1,2-Dichloroethene	ug/L	ND	5.0	09/06/18 14:15	M5
trans-1,3-Dichloropropene	ug/L	ND	5.0	09/06/18 14:15	M5
trans-1,4-Dichloro-2-butene	ug/L	ND	100	09/06/18 14:15	M5
Trichloroethene	ug/L	ND	5.0	09/06/18 14:15	M5
Trichlorofluoromethane	ug/L	ND	5.0	09/06/18 14:15	M5
Vinyl acetate	ug/L	ND	50.0	09/06/18 14:15	M5
Vinyl chloride	ug/L	ND	2.0	09/06/18 14:15	M5
Xylene (Total)	ug/L	ND	10.0	09/06/18 14:15	M5
4-Bromofluorobenzene (S)	%.	98	85-111	09/06/18 14:15	M5
Dibromofluoromethane (S)	%.	101	89-116	09/06/18 14:15	M5
Toluene-d8 (S)	%.	98	87-110	09/06/18 14:15	M5

LABORATORY CONTROL SAMPLE: 2125810

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	53.9	108	80-120	M5
1,1,1-Trichloroethane	ug/L	50	52.0	104	74-126	M5
1,1,2,2-Tetrachloroethane	ug/L	50	50.4	101	73-117	M5
1,1,2-Trichloroethane	ug/L	50	53.7	107	74-119	M5

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

LABORATORY CONTROL SAMPLE: 2125810

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1-Dichloroethane	ug/L	50	47.3	95	72-119	M5
1,1-Dichloroethene	ug/L	50	49.0	98	72-123	M5
1,1-Dichloropropene	ug/L	50	50.5	101	77-125	M5
1,2,3-Trichlorobenzene	ug/L	50	52.9	106	74-125	M5
1,2,3-Trichloropropane	ug/L	50	51.0	102	82-121	M5
1,2,4-Trichlorobenzene	ug/L	50	51.7	103	70-125	M5
1,2,4-Trimethylbenzene	ug/L	50	49.8	100	76-118	M5
1,2-Dibromoethane (EDB)	ug/L	50	51.0	102	80-120	M5
1,2-Dichlorobenzene	ug/L	50	50.5	101	77-117	M5
1,2-Dichloroethane	ug/L	50	46.0	92	69-122	M5
1,2-Dichloropropane	ug/L	50	47.3	95	75-124	M5
1,3,5-Trimethylbenzene	ug/L	50	49.1	98	75-117	M5
1,3-Dichlorobenzene	ug/L	50	50.1	100	76-116	M5
1,3-Dichloropropane	ug/L	50	50.8	102	82-118	M5
1,4-Dichlorobenzene	ug/L	50	48.3	97	74-115	M5
1-Methylnaphthalene	ug/L	50	54.1	108	70-130	M5,N2
2,2-Dichloropropane	ug/L	50	52.6	105	51-133	M5
2-Butanone (MEK)	ug/L	250	254	102	72-147	M5
2-Chlorotoluene	ug/L	50	51.1	102	73-113	M5
2-Hexanone	ug/L	250	246	99	71-132	M5
2-Methylnaphthalene	ug/L	50	53.7	107	69-123	M5
4-Chlorotoluene	ug/L	50	51.1	102	78-118	M5
4-Methyl-2-pentanone (MIBK)	ug/L	250	247	99	89-128	M5
Acetone	ug/L	250	263	105	46-170	M5
Acrolein	ug/L	1000	1060	106	13-200	M5
Acrylonitrile	ug/L	200	201	101	65-130	M5
Benzene	ug/L	50	48.8	98	78-117	M5
Bromobenzene	ug/L	50	50.8	102	66-126	M5
Bromochloromethane	ug/L	50	57.5	115	76-120	M5
Bromodichloromethane	ug/L	50	51.8	104	76-120	M5
Bromoform	ug/L	50	48.8	98	70-124	M5
Bromomethane	ug/L	50	55.7	111	29-181	M5
Carbon disulfide	ug/L	50	47.9	96	66-123	M5
Carbon tetrachloride	ug/L	50	51.9	104	73-132	M5
Chlorobenzene	ug/L	50	49.1	98	79-112	M5
Chloroethane	ug/L	50	51.8	104	59-156	M5
Chloroform	ug/L	50	50.0	100	76-118	M5
Chloromethane	ug/L	50	38.3	77	45-142	M5
cis-1,2-Dichloroethene	ug/L	50	51.6	103	75-117	M5
cis-1,3-Dichloropropene	ug/L	50	50.8	102	77-120	M5
Dibromochloromethane	ug/L	50	52.0	104	78-123	M5
Dibromomethane	ug/L	50	54.0	108	78-122	M5
Dichlorodifluoromethane	ug/L	50	52.5	105	41-168	M5
Ethyl methacrylate	ug/L	200	201	101	75-128	M5
Ethylbenzene	ug/L	50	49.7	99	80-118	M5
Hexachloro-1,3-butadiene	ug/L	50	57.4	115	73-125	M5
Iodomethane	ug/L	100	89.3	89	35-174	M5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

LABORATORY CONTROL SAMPLE: 2125810

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Isopropylbenzene (Cumene)	ug/L	50	51.2	102	81-117	M5
Methyl-tert-butyl ether	ug/L	50	50.1	100	71-124	M5
Methylene Chloride	ug/L	50	52.0	104	59-136	M5
n-Butylbenzene	ug/L	50	52.3	105	72-118	M5
n-Hexane	ug/L	50	52.0	104	60-128	M5
n-Propylbenzene	ug/L	50	50.5	101	75-120	M5
Naphthalene	ug/L	50	51.7	103	67-126	M5
p-Isopropyltoluene	ug/L	50	50.1	100	75-115	M5
sec-Butylbenzene	ug/L	50	50.7	101	76-120	M5
Styrene	ug/L	50	50.6	101	74-121	M5
tert-Butylbenzene	ug/L	50	44.4	89	55-109	M5
Tetrachloroethene	ug/L	50	50.5	101	76-116	M5
Toluene	ug/L	50	47.5	95	77-115	M5
trans-1,2-Dichloroethene	ug/L	50	50.1	100	75-121	M5
trans-1,3-Dichloropropene	ug/L	50	50.0	100	77-121	M5
trans-1,4-Dichloro-2-butene	ug/L	200	207	103	42-128	M5
Trichloroethene	ug/L	50	49.0	98	76-120	M5
Trichlorofluoromethane	ug/L	50	49.1	98	81-141	M5
Vinyl acetate	ug/L	200	194	97	67-131	M5
Vinyl chloride	ug/L	50	49.9	100	64-155	M5
Xylene (Total)	ug/L	150	158	105	78-118	M5
4-Bromofluorobenzene (S)	%.			100	85-111	M5
Dibromofluoromethane (S)	%.			101	89-116	M5
Toluene-d8 (S)	%.			99	87-110	M5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALIFIERS

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 460612

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

ANALYTE QUALIFIERS

M5 A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

N2 The lab does not hold NELAC/TNI accreditation for this parameter.

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: O'Neal's Clothes Depot
Pace Project No.: 50204603

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50204603001	**MW-02_WG_180827**	EPA 5030/8260	460081		
50204603002	**MW-03_WG_180828**	EPA 5030/8260	460081		
50204603003	**MW-05_WG_180828**	EPA 5030/8260	460081		
50204603004	**MW-07_WG_180828**	EPA 5030/8260	460081		
50204603005	**MW-11_WG_180828**	EPA 5030/8260	460081		
50204603006	**MW-12_WG_180828**	EPA 5030/8260	460081		
50204603007	**MW-21_WG_180828**	EPA 5030/8260	460081		
50204603008	**MW-23_WG_180828**	EPA 5030/8260	460081		
50204603009	**MW-25_WG_180828**	EPA 5030/8260	460082		
50204603010	**MW-27_WG_180829**	EPA 5030/8260	460082		
50204603011	**MW-28_WG_180829**	EPA 5030/8260	460082		
50204603012	**MW-29_WG_180829**	EPA 5030/8260	460082		
50204603013	**MW-04_WG_180829**	EPA 5030/8260	460082		
50204603014	**MW-01_WG_180829**	EPA 5030/8260	460082		
50204603015	**MW-14_WG_180829**	EPA 5030/8260	460082		
50204603016	**MW-17_WG_180828**	EPA 5030/8260	460082		
50204603017	**MW-13_WG_180829**	EPA 5030/8260	460082		
50204603018	**MW-10_WG_180828**	EPA 5030/8260	460082		
50204603019	**MW-08_WG_180828**	EPA 5030/8260	460082		
50204603020	**MW-16_WG_180829**	EPA 5030/8260	460082		
50204603021	**MW-18_WG_180830**	EPA 5030/8260	460082		
50204603022	**MW-20_WG_180830**	EPA 5030/8260	460082		
50204603023	**MW-06_WG_180830**	EPA 5030/8260	460082		
50204603024	**MW-19_WG_180829**	EPA 5030/8260	460082		
50204603025	**MW-9D_WG_180829**	EPA 5030/8260	460082		
50204603026	**MW-09_WG_180829**	EPA 5030/8260	460082		
50204603027	**MW-26_WG_180829**	EPA 5030/8260	460082		
50204603028	**MW-22_WG_180830**	EPA 5030/8260	460082		
50204603029	**MW-24_WG_180830**	EPA 5030/8260	460612		
50204603030	**MW-15D_WG_180830**	EPA 5030/8260	460612		
50204603031	**MW-15_WG_180830**	EPA 5030/8260	460612		
50204603032	**DUP-01_WG_180830**	EPA 5030/8260	460612		
50204603033	**DUP-02_WG_180830**	EPA 5030/8260	460612		
50204603034	**EQB-1_WD_180830**	EPA 5030/8260	460612		
50204603035	**EQB-2_WD_180830**	EPA 5030/8260	460612		
50204603036	**TB-01_WD_180827**	EPA 5030/8260	460612		

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 3

Section A Required Client Information:
Company: Wilcox Environmental Engineering
Address: 1552 Main Street Suite 100, Speedway, Indiana
N/A
Email To: jkinman@wilcoxenv.com dataservices@wilcoxenv.com
Phone: 317-472-0999 Fax: N/A
Requested Due Date/TAT: Standard

Section B Required Project Information:
Report To: jkinman@wilcoxenv.com
Copy To: jprice@wilcoxenv.com
N/A
Purchase Order No.: N/A
Project Name: O'Neals Clothes Depot
Project Number: 341.14-114N

Section C Invoice Information:
Attention: accountspayable@wilcoxenv.com
Company Name: Wilcox Environmental Engineering
Address: 1552 Main Street Suite 100, Speedway, Indiana
Pace Quote Reference: N/A
Pace Project Manager: Mark Davis
Pace Profile #: N/A

REGULATORY AGENCY
NPDES X GROUND WATER DRINKING WATER
UST RCRA OTHER

SITE LOCATION: GA IL X IN MI NC OH SC WI OTHER

Filtered (Y/N)
Requested Analysis: VOCs 8260
Residual Chlorine (Y/N)
Pace Project No./Lab I.D.: 50204603

Section D Required Client Information
Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW, WATER WT, WASTE WATER WW, PRODUCT P, SOIL/SOLID SL, OIL OL, WP, AR, OT, TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	VOCs 8260	Residual Chlorine (Y/N)	Pace Project No./Lab I.D.
1	MW-02_WG_180827	WT	G	8/27/18	1139		3				X					X		001
2	MW-03_WG_180828	WT	G	8/28/18	1032		3				X					X		002
3	MW-05_WG_180828	WT	G	8/28/18	0943		3				X					X		003
4	MW-07_WG_180828	WT	G	8/28/18	1117		3				X					X		004
5	MW-11_WG_180828	WT	G	8/28/18	1120		3				X					X		005
6	MW-12_WG_180828	WT	G	8/28/18	1212		3				X					X		006
7	MW-21_WG_180828	WT	G	8/28/18	1313		3				X					X		007
8	MW-23_WG_180828	WT	G	8/28/18	1406		3				X					X		008
9	MW-25_WG_180828	WT	G	8/28/18	1502		3				X					X		009
10	MW-27_WG_180829	WT	G	8/29/18	1022		3				X					X		010
11	MW-28_WG_180829	WT	G	8/29/18	1127		3				X					X		011
12	MW-29_WG_180829	WT	G	8/29/18	1227		3				X					X		012

ITEM #	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
QAQC Level II	Jacob M Price /Wilcox	8/30/18	1725	[signature]	8/30/18	1725	3.6	Y	Y	Y
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Jacob M. Price
SIGNATURE of SAMPLER: Jacob M. Price
DATE Signed (MM / DD / YY): 8/30/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 2 of 3

Section A — **Required** Client Information:

Company:	Wilcox Environmental Engineering
Address:	1552 Main Street Suite 100, Speedway, Indiana
	N/A
Email To:	jkinman@wilcoxenv.com, dataservices@wilcoxenv.com
Phone:	317-472-0999
Fax:	N/A
Requested Due Date/TAT:	Standard

Section B — **Required** Project Information:

Report To:	jkinman@wilcoxenv.com
Copy To:	
	N/A
Purchase Order No.:	N/A
Project Name:	O'Neals Clothes Depot
Project Number:	341.14-114 N

Section C — Invoice Information:

Attention:	accountspayable@wilcoxenv.com
Company Name:	Wilcox Environmental Engineering
Address:	1552 Main Street Suite 100, Speedway, Indiana
Pace Quote Reference:	N/A
Pace Project Manager:	Mark Davis
Pace Profile #:	N/A

REGULATORY AGENCY

NPDES — X GROUND WATER — DRINKING WATER — UST — RCRA — OTHER

SITE LOCATION: GA — IL — X IN — MI — NC — OH — SC — WI — OTHER

Filtered (Y/N)

Requested Analysis: VOCs 8260

Pace Project No./Lab I.D.: 5024603

Section D Required Client Information — Valid Matrix Codes: MATRIX / CODE: DRINKING WATER DW, WATER WT, WASTE WATER WW, PRODUCT P, SOIL/SOLID SL, OIL OL, WIPE WP, AIR AR, OTHER OT, TISSUE TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	[redacted]	COLLECTED COMPOSITE END/GRAB DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	VOCs 8260	Residual Chlorine (Y/N)	Pace Project No./Lab I.D.
1	MW-04_WG_180829	WT	G		8/29/18	1322		3				X					X		013
2	MW-01_WG_180829	WT	G		8/29/18	1410		3				X					X		014
3	MW-14_WG_180829	WT	G		8/29/18	1501		3				X					X		015
4	MW-17_WG_180828	WT	G		8/28/18	1230		3				X					X		016
5	MW-13_WG_180829	WT	G		8/29/18	1545		3				X					X		017
6	MW-10_WG_180828	WT	G		8/28/18	1415		3				X					X		018
7	MW-08_WG_180828	WT	G		8/28/18	1520		3				X					X		019
8	MW-16_WG_180829	WT	G		8/29/18	1030		3				X					X		020
9	MW-18_WG_180830	WT	G		8/30/18	0922		3				X					X		021
10	MW-20_WG_180830	WT	G		8/30/18	1016		3				X					X		022
11	MW-06_WG_180830	WT	G		8/30/18	1110		3				X					X		023
12	MW-19_WG_180829	WT	G		8/29/18	1210		3				X					X		024

ITEM #	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice Y/N	Custody Sealed Cooler Y/N	Samples Intact Y/N
QAQC Level II	Jacob M. Price /Wilcox	8/30/18	1725	[signature]	8/30/18	1725	3.6	N	Y	N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jacob M. Price

SIGNATURE of SAMPLER: Jacob M. Price

DATE Signed (MM / DD / YY): 8/30/18

CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 3 of 3

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Wilcox Environmental Engineering	Report To: jkinman@wilcoxenv...	Attention: accountspayable@wilcoxenv.com
Address: 1552 Main Street Suite 100, Speedway, Indiana	Copy To:	Company Name: Wilcox Environmental Engineering
N/A	N/A	Address: 1552 Main Street Suite 100, Speedway, Indiana
Email To: jkinman@wilcoxenv.com dataservices@wilcoxenv.com	Purchase Order No.: N/A	Pace Quote Reference: N/A
Phone: 317-472-0999 Fax: N/A	Project Name: O'Neal's Clothes Depot	Pace Project Manager: Mark Davis
Requested Due Date/TAT: Standard	Project Number: 341.14-114	Pace Profile #: N/A

REGULATORY AGENCY: NPDES; X GROUND WATER; DRINKING WATER; UST; RCRA; OTHER

SITE LOCATION: GA; IL; X IN; MI; NC; OH; SC; WI; OTHER

Filtered (Y/N)

Requested Analysis: VOCs 8260; Residual Chlorine (Y/N)

50204603

Section D Required Client Information — Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED DATE (COMPOSITE END/GRAB)	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	VOCs 8260	Pace Project No./ Lab I.D.
1	MW-9D_WG_180829	WT	G	8/29/18	1330		3				X					X	025
2	MW-09_WG_180829	WT	G	8/29/18	1425		3				X					X	026
3	MW-26_WG_180829	WT	G	8/29/18	1610		3				X					X	027
4	MW-22_WG_180830	WT	G	8/30/18	1158		3				X					X	028
5	MW-24_WG_180830	WT	G	8/30/18	0940		3				X					X	029
6	MW-15D_WG_180830	WT	G	8/30/18	1100		3				X					X	030
7	MW-15_WG_180830	WT	G	8/30/18	1145		3				X					X	031
8	Dup-01_WG_180830	WT	G	8/30/18	0000		3				X					X	032
9	Dup-02_WG_180830	WT	G	8/30/18	0000		3				X					X	033
10	EQB-1_WD_180830	WT	G	8/30/18	1120		3				X					X	034
11	EQB-2_WD_180830	WT	G	8/30/18	1110		3				X					X	035
12	TB-01_WD_180827	WT	G	8/27/18	0000		3				X					X	036

ITEM #	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice Y/N	Custody Sealed Cooler Y/N	Samples Intact Y/N
QAQC Level II	Jacob M. Price /Wilcox	8/30/18	1725	[signature]	8/30/18	1725	3.6	Y	N	Y
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N
								Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jacob M. Price

SIGNATURE of SAMPLER: Jacob M. Price

DATE Signed (MM / DD / YY): 8/30/18

Pace Analytical

SAMPLE CONDITION UPON RECEIPT FORM

Project #: 5024603

Date/Time and Initials of person examining contents: [illegible] 8/30/18 1825

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No **Seals Intact:** ☐ Yes ☑ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer: 1 2 3 4 5 6 A B C D E F Ice Type: ☑ Wet ☐ Blue ☐ None | Samples collected today and on ice: ☐ Yes ☐ No ☑ N/A

Cooler Temperature: 3.3/3.6 Ice Visible in Sample Containers?: ☐ Yes ☑ No ☐ N/A

(Initial/Corrected) Temp should be above freezing to 6°C If temp. is Over 6°C or under 0°C, was the PM Notified?: ☐ Yes ☐ No ☑ N/A

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
Are samples from West Virginia? Document any containers out of temp.		✓	All containers needing acid/base pres. Have been checked?: **exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.** All containers needing preservation are found to be in compliance with EPA recommendation (<2, >9, >12) unless otherwise noted. Circle: HNO3 H2SO4 NaOH NaOH/ZnAc			✓
USDA Regulated Soils? (ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓				
Chain of Custody Present:	✓					
Chain of Custody Filled Out:	✓		Dissolved Metals field filtered?:			✓
Short Hold Time Analysis (<72hr)?: Analysis:		✓	Headspace Wisconsin Sulfide			✓
Time 5035A TC placed in Freezer or Short Holds To Lab:				Present	Absent	N/A
			Residual Chlorine Check (SVOC 625 Pest/PCB 608)			✓
			Residual Chlorine Check (Total/Amenable/Free Cyanide)			✓
Rush TAT Requested:		✓	Headspace in VOA Vials (>6mm):	✓	~~✓~~	
Containers Intact?:	✓		Trip Blank Present?:	✓		
Sample Labels Match COC?: Except TCs, which only require sample ID	✓		Trip Blank Custody Seals?:	✓		

Comments: HS>6mm TRIP BLANK 3/3

Sample Container Count

CLIENT: Wilcox

COC PAGE 1 of 3

COC ID#

Project # 5024603

Sample Line Item	DG9H / VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk SBS DI Kit R				Matrix Sl/Wt/NAL (Soil/Water/Non-Aqueous Liquid)	pH <2	pH >9	pH>12
1	3																				wt			
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass

Code	Description	Code	Description
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

Code	Description	Code	Description
BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

Sample Container Count

CLIENT: Wilcox

COC PAGE 2 of 3

COC ID# ____________

Project # 50254603

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit SBS DI R				Matrix Sl/Wt/NAL (Soil/Water/Non-Aqueous Liquid)	pH <2	pH >9	pH>12
1	3																				wt			
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass			
DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.			
BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

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Sample Container Count

CLIENT: Wilcox

COC PAGE 3 of 3

COC ID# ______

Project # 50204603

Sample Line Item	DG9H VG9H	AG0U	AG1H	AG1U	AG2U	AG3S	WGFU	SP5T	BP1U	BP2N	BP2S	BP2U	BP3B	BP3N	BP3S	BP3U	Bulk Kit R				Matrix SI/WP (Soil/Water Aqueous Liquid)	pH <2	pH >9	pH>12
1	3																				WT			
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Container Codes

Glass

DG9B	40mL Na Bisulfate amber vial	AG0U	100mL unpreserved amber glass
DG9H	40mL HCL amber voa vial	AG1H	1 liter HCL amber glass
DG9M	40mL MeOH clear vial	AG1S	1 liter H2SO4 amber glass
DG9P	40mL TSP amber vial	AG1T	1 liter Na Thiosulfate amber glass
DG9S	40mL H2SO4 amber vial	AG1U	1liter unpreserved amber glass
DG9T	40mL Na Thio amber vial	AG2N	500mL HNO3 amber glass
DG9U	40mL unpreserved **amber** vial	AG2S	500mL H2SO4 amber glass
VG9H	40mL HCL clear vial	AG2U	500mL unpreserved amber glass
VG9T	40mL Na Thio. clear vial	AG3S	250mL H2SO4 glass amber
VG9U	40mL unpreserved **clear** vial	AG3U	250mL unpreserved amber glass
VGFX	40mL w/hexane wipe vial	BG1H	1 liter HCL clear glass
VSG	Headspace septa vial & HCL	BG1S	1 liter H2SO4 clear glass
WGAU	8oz unpreserved clear jar	BG1T	1 liter Na Thiosulfate clear glass
WGFU	4oz clear soil jar	BG1U	1 liter unpreserved glass
JGFU	4oz unpreserved amber wide	BG3H	250mL HCl Clear Glass
		BG3U	250mL Unpreserved Clear Glass

Plastic / Misc.

BP1A	1 liter NaOH, Asc Acid plastic	BP3U	250mL unpreserved plastic
BP1N	1 liter HNO3 plastic	BP3Z	250mL NaOH, Zn Ac plastic
BP1S	1 liter H2SO4 plastic		
BP1U	1 liter unpreserved plastic	AF	Air Filter
BP1Z	1 liter NaOH, Zn, Ac	C	Air Cassettes
BP2A	500mL NaOH, Asc Acid plastic	R	Terra core kit
BP2N	500mL HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
BP2O	500mL NaOH plastic	U	Summa Can
BP2S	500mL H2SO4 plastic	ZPLC	Ziploc Bag
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3S	250mL H2SO4 plastic		

F-IN-Q-270-rev.10,31Aug2017

APPENDIX Q

ISCR Design and Implementation

REGENESIS
REMEDIATION SERVICES
Technology-Based Solutions for the Environment

August 29, 2019

To:	Jeremy Kinman, Wilcox Environmental Engineering, 1552 Main St, Suite 100, Speedway, IN 46224
Project #:	OwM60435
Subject:	Proposal for Full Scale Remedial Application Services using PlumeStop Liquid Activated Carbon®, Hydrogen Release Compound, and Bio-Dechlor Inoculum® Plus at the O'Neals Clothes Depot Cleaners site in Martinsville, Indiana

REGENESIS Remediation Services (RRS) appreciates the opportunity to evaluate this project and provide Wilcox Environmental Engineering (Wilcox) with this proposal. We have provided information related to the design and application of PlumeStop Liquid Activated Carbon® (PlumeStop), Hydrogen Release Compound (HRC), and Bio-Dechlor Inoculum® Plus (BDI Plus). In addition, a dilute solution of calcium chloride will be applied to increase the rate of PlumeStop deposition in the target treatment areas. This remediation plan will reduce the levels of the contaminate of concern (COC) concentrations within the defined treatment areas at this site located in Martinsville, Indiana.

Product Description

PlumeStop liquid activated carbon is an innovative groundwater remediation technology designed to rapidly remove and permanently degrade groundwater contaminants. PlumeStop is composed of very fine particles of activated carbon suspended in water through the use of unique organic polymer dispersion chemistry. Once in the subsurface, the material behaves as a colloidal biomatrix, binding to the aquifer matrix, rapidly removing contaminants from groundwater and expediting permanent contaminant biodegradation.

This unique remediation technology accomplishes treatment with the use of highly dispersible, fast-acting, sorption-based technology, capturing and concentrating dissolved-phase contaminants within its matrix-like structure. Once contaminants are sorbed onto the regenerative matrix, biodegradation processes achieve complete remediation at an accelerated rate.

HRC is an engineered, hydrogen release compound designed specifically for enhanced, in situ anaerobic bioremediation of chlorinated compounds in groundwater or highly saturated soils. Upon contact with groundwater, this viscous, poly-lactate ester material becomes hydrated and subject to microbial breakdown producing a controlled-release of hydrogen for periods of up to 18-24 months on a single application. HRC enables enhanced anaerobic biodegradation by adding hydrogen (an electron donor) to groundwater and/or soil to increase the number and vitality of indigenous microorganisms able to perform the naturally occurring process of enhanced reductive dechlorination. During this process, certain naturally occurring microorganisms replace chlorine atoms on chlorinated contaminants with the newly available hydrogen effectively reducing the contaminant to a less harmful substance with the preferred and innocuous endpoints of ethane or ethane.

BDI Plus is designed for use at sites where chlorinated contaminants are present and unable to be completely biodegraded via the existing microbial communities. BDI Plus is an enriched, natural microbial consortium containing species of Dehalococcoides sp. (DHC) which are capable of completely dechlorinating contaminants during in situ

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anaerobic bioremediation processes. BDI Plus has been shown to stimulate the rapid dechlorination of chlorinated compounds such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC).

Summary of Relevant Design Information

Four (4) target treatment areas have been identified on the attached map (Barriers A, B, C, D). The total treatment area consists of approximately 600 linear feet. The injection interval is 9 feet (ft.) to 16 ft. below ground surface (bgs) for Barriers A, B, and D, and 12 ft. to 20 ft. bgs for Barrier C. A summary of design parameters for each barrier are presented below.

Barrier A

- Surficial Treatment – 310 linear feet
- Vertical Treatment Interval –from 9 to 16 ft. bgs
- Remediation Technologies:
  - PlumeStop – 14,000 lbs.
  - Calcium Chloride – 3,800 lbs.
  - HRC – 1,320 lbs.
  - BDI Plus – 19 liters (co-applied – slip stream method)
- Injection Points: 93 DPT
  - 62 PlumeStop Points
  - 31 HRC Points
- Bottom-Up Approach and Expendable Points

Barrier B

- Surficial Treatment – 120 linear feet
- Vertical Treatment Interval –from 9 to 16 ft. bgs
- Remediation Technologies:
  - PlumeStop – 4,000 lbs.
  - Calcium Chloride – 1,100 lbs.
  - HRC – 520 lbs.
  - BDI Plus – 8 liters (co-applied – slip stream method)
- Injection Points: 36 DPT
  - 24 Plumestop Points
  - 12 HRC Points
- Bottom-Up Approach and Expendable Points

Barrier C

- Surficial Treatment – 170 linear feet
- Vertical Treatment Interval –from 12 to 20 ft. bgs
- Remediation Technologies:
  - PlumeStop – 6,000 lbs.
  - Calcium Chloride – 1,200 lbs.
  - HRC – 840 lbs.
  - BDI Plus – 12 liters (co-applied – slip stream method)
- Injection Points: 51 DPT
  - 34 Plumestop Points

- 17 HRC Points
- Bottom-Up Approach and Expendable Points

Barrier D

- Surficial Treatment – 160 linear feet
- Vertical Treatment Interval –from 9 to 16 ft. bgs
- Remediation Technologies:
    - PlumeStop – 7,200 lbs.
    - Calcium Chloride – 2,000 lbs.
    - HRC – 680 lbs.
    - BDI Plus – 10 liters (co-applied – slip stream method)
- Injection Points: 48 DPT
    - 32 Plumestop Points
    - 16 HRC Points
- Bottom-Up Approach and Expendable Points

Scope of Work

RRS will work under the direction of Wilcox to implement the field work associated with the application of the selected remediation technologies. Responsibilities for the implementation of this scope of work will be shared between RRS and Wilcox. Responsibilities for each are listed below and further under the Assumptions/Qualification section:

RRS Responsibilities

- **RRS** will provide and ship the specified quantities of PlumeStop, HRC, and BDI Plus to the site prior to personnel mobilization. Product shipment will be split into two (2) events. Please note the shipping estimate included as part of this cost assume two (2) shipments to the project site location at 833 East Morgan Street, Martinsville, IN 46151. Alternative shipping location or phases could result in an increase in total costs. RRS will work with you to the best of our ability to avoid shipping overages. The first shipping event will take place prior to mobilization for the application event and should be onsite ready for application upon arrival of the RRS application team.
- **RRS** will provide qualified personnel and support equipment to handle, prepare, and apply the remediation technologies during application. The following tasks are included:
    - Mix and prepare PlumeStop and HRC for application
    - Apply the BDI Plus using a slip-streaming method
    - Injection equipment (pumps, mixing tanks, delivery manifold, injection heads with flow & pressure gauges, safety bypass valves, first aid station, etc.)
    - PPE and safety equipment for RRS personnel
    - 300 linear feet of 1.5-inch National Standard Fire Hose
- **RRS** will prepare and implement a site-specific health and safety plan.
- **RRS** will provide a direct push contractor to assist with drilling activities for the duration of the project.
- Budget crew to work up to 9.5 hours per weekday on site.
- **RRS** will water rinse empty PlumeStop and HRC containers daily (totes/buckets).
- **RRS** will provide a means to maneuver product around the site as needed during the application activities.

- **RRS** will perform real time reagent distribution monitoring for optimization of the injection design during the application activities.
- Application Summary Report including injection depths, material quantities, elapsed time, injection pressures, surfacing of material and other noteworthy field observations.

Wilcox Responsibilities

- **Wilcox** will receive all product delivery at the site based on the delivery schedule. **Wilcox** will unload product from delivery trucks utilizing a forklift or equivalent, arrange for secure storage to protect form inclement weather (i.e., freezing, etc.). If material is stored off-site, **Wilcox** will coordinate the delivery of the material to the site. The product will be shipped all at once. If additional deliveries are requested, changes to the price will be incorporated as necessary. The PlumeStop will be delivered in 2,000 lbs. totes. HRC will be delivered in 40 lbs. buckets. The BDI Plus will be shipped in coolers. Calcium Chloride will be shipped on palets. Cost for delivery acceptance has not been included.
- **Wilcox** will provide a water source (e.g. hydrant) capable of producing at least 30 gpm for the duration of the project within 300 ft. of the project staging area, at no cost to RRS. **Wilcox** will coordinate and provide a backflow preventer for on-site hydrants utilization.
- All empty product containers will be the responsibility of **Wilcox** for proper disposal/recycling. General refuse will be collected and disposed of in a **Wilcox** provided refuse container on-site.
- Any traffic control requirement beyond providing cones and caution tape is the responsibility of **Wilcox** (including permits, street signs, etc.…).
- **Wilcox** will provide a field water quality meter similar to a YSI 556 with a down-hole sensor capable of reaching the water table and well screen interval while on-site for injection activities.

Project Cost

We have estimated the following cost for implementation of the remedial design by our remediation services division, RRS. A breakdown for materials and services is shown below.

- Remediation Products - $286,375.69 (invoiced for product shipped to site)
- RRS Application Services - $228,174.31 (invoiced monthly)*
- Total Estimated Project Cost - $514,550.00

The cost provided above are inclusive of all products, product mixing, injection services as outlined, materials, tax, and shipping to complete the work. Payment terms are net 30 days upon invoice submittal.

***Please note that this pricing is contingent upon completion of this scope of work without delays or work stoppages once mobilization occurs. All work is assumed to be completed in above freezing temperatures and within daylight hours. If freezing temperature are encountered during work activities, RRS is not responsible for the potential loss in production and will utilize the daily rate mentioned below if work is completed beyond the anticipated number of days. RRS has allotted 34 on-site working days (9.5-hr days, Monday through Friday) to apply the remediation technologies. RRS estimates a daily average production rate during the application of 2,500 gallons per day based on the current design parameters. If the application is completed behind schedule, a daily rate of $5,600.00 will be added to the invoice price.**

RRS reserves the right to modify the design and associated cost if additional information gathered warrants modification. Invoicing may broken into multiple invoices to cover the entire cost associated with work.

Assumption/Qualifications

In generating this proposal, REGENESIS relied upon professional judgment and site-specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site. Other assumptions and qualifications related to this proposal are as follows:

- The above cost outlined will be valid for 60 days from date or proposal. If beyond 60 days, REGENESIS reserves the right to update cost.
- **Wilcox** personnel will take delivery of the PlumeStop, HRC, CaCl and BDI Plus and arrange for secure storage. The product will be shipped over two (2) shipping events. If additional deliveries are requested, changes to the price will be incorporated as necessary. If material is stored off-site, **Wilcox** personnel will coordinate the delivery of the material to the site.
- RRS will have access to the site for equipment operation and secure storage of materials and equipment. All access to each work area location will be clear and free of obstructions. RRS also assumes the injection trailer will be staged within 80 ft. of the furthest injection point location.
- **Wilcox** will provide access to a restroom during on-site hours. RRS has not included costs to provide a portable restroom onsite.
- Pricing and work schedule assumes prevailing wages are not necessary.
- **Wilcox** is responsible for securing any permits prior to mobilizing to the site, including traffic control and management.
- **Wilcox** is responsible for all soil, air and groundwater sampling and analysis.
- **Wilcox** is responsible for transportation and disposal of any contaminated waste generated on-site during injection activities, though we do not anticipate generating any such waste during injection activities.
- **RRS** will call in a public utility locate for the area in or near the direct push injection zones. All private, on-site underground utilities and any known subsurface features (e.g., piping, storage tanks, septic systems, etc.) will be clearly marked/cleared by **Wilcox** prior to RRS mobilization to the site. RRS is not responsible for damage to any unmarked utilities or subsurface features. If as-built drawings are available for any on-site subsurface features, RRS request the right to review these drawing with the Wilcox to confirm clearance for the advancement of DPT injection points.
- For safety reasons, access to the treatment area will be limited to RRS and Wilcox personnel. RRS will provide delineators and cones to section off working areas. Wilcox will provide traffic control and coordinate with local authorities to shut down any section of the work area in the right-of-way.

- The proposed quantity of reagents can be delivered to the treatment area without significant surfacing/short-circuiting via the prescribed number of injection points. RRS will not be responsible for any treatment chemistry infiltration into undesired locations.
- RRS personnel can have access to site for work up to 12 hours per day Sunday-Saturday, though, in generating the costs, a 9.5-hour, Monday through Friday, work day was assumed. Additional charges may apply for Saturday and/or Sunday work schedules.
- This proposal assumes probing and drilling will begin at the ground surface. If hand auger, concrete/asphalt coring, or air knife services are required, additional charges, including surface restoration charges could apply.

Note* REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

We sincerely appreciate the opportunity to present you with this proposal. If you need any additional information, please feel free to contact Andrew Kavanagh at 574.304.4353 or Brett Hicks at 765.256.0272.

REGENESIS

Andrew Kavanagh
Remediation Services Project Manager

Brett Hicks
Ohio Valley District Manager

Attachments: Map and Design Output Pages

Please sign below to acknowledge acceptance of proposal **OwM60435** for the **O'Neals Clothes Depot Cleaners** and authorize RRS to perform stated work:

Wilcox Environmental Engineering

Authorized Signature Date

Name (print) P.O. or Project Number

Signature above confirms signee has reviewed the proposal and agrees with all outlined responsibilities and assumptions/qualifications. Below is a list of next steps toward implementation of this project. Please note these steps may take 3-5 weeks to complete depending upon the complexity of the project and previous experience with your company. REGENESIS Remediation Services will contact you soon to begin the implementation process.

Steps to Project Implementation

- Sign acceptance of proposal
- Finalize MSA or other agreements (if applicable)
- Confirm account status
- Complete remediation services logistics evaluation
- Confirm delivery address and date
- Schedule application

WILCOX PROJECT # 341.14
PROJECT MANAGER J. KINMAN
FILE NO. 3411403
SCALE 1" = 80'
DATE 09/14/18
FIGURE NO. 1

VAPOR INTRUSION ASSESSMENT (SUMMER 2018)

O'NEAL'S CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX ENVIRONMENTAL ENGINEERING

REGENESIS

Project Info

O'Neal Clothes Depot Cleaners
Martinsville, IN
Dissolved Plume: Barrier A

Prepared For:
Wilcox

Target Treatment Zone (TTZ) Info	Unit	Value
Barrier Length	ft	310
Top Treat Depth	ft	9.0
Bot Treat Depth	ft	16.0
Vertical Treatment Interval	ft	7.0
Treatment Zone Volume	ft^3	32,550
Treatment Zone Volume	cy	1,206
Soil Type	---	sand
Porosity	cm^3/cm^3	0.33
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	80,352
Treatment Zone Effective Pore Volume	gals	48,698
Treatment Zone Pore Volume	liters	304164
Treatment Zone Effective Pore Volume	liters	184342
Fraction Organic Carbon (foc)	g/g	0.002
Soil Density	g/cm^3	1.7
Soil Density	lb/ft^3	108
Soil Weight	lbs	3.5E+06
Hydraulic Conductivity	ft/day	155.0
Hydraulic Conductivity	cm/sec	5.47E-02
Hydraulic Gradient	ft/ft	0.006
GW Velocity	ft/day	4.26
GW Velocity	ft/yr	1557

Application Dosing	Unit	Value
PlumeStop to be Applied	**lbs**	**14,000**
HRC to be Applied	**lbs**	**1,320**
BDI Plus to be Applied	**Liters**	**19**

PlumeStop® Application Design Summary

Dissolved Plume: Barrier A

PlumeStop	
Barrier Length (ft)	**310**
Spacing Within Barrier (ft)	10
Number of Lines	2
Application Points	**62**
Application Method	**Direct Push**
Top Application Depth (ft bgs)	9
Bottom Application Depth (ft bgs)	16
PlumeStop to be Applied (lbs)	**14,000**
PlumeStop to be Applied (gals)	1,554
AquaZVI to be added to PlumeStop (lbs)	0
AquaZVI to be added to PlumeStop (gals)	0
PlumeStop Volume Totals	
Mixing Water (gal)	19,424
Total Application Volume (gals)	**20,978**
Injection Volume per Point (gals)	338
Anaerobic Bioremediation - HRC	
HRC Application Points	**31**
HRC to be Applied (lbs)	**1,320**
HRC per point (lbs)	43
Total Application Volume (gals)	**122**
Injection Volume per Point (gals)	3.9
Bioaugmentation - BDI Plus	
BDI Plus Application Points	**31**
BDI Plus to be Applied (Liters)	**19**
BDI Plus per point (Liters)	0.6

Technical Notes/Discussion

Co-mix and inject 3,800 lbs of Calcium Chloride with PlumeStop

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

Prepared by: Owen Miller - Design Specialist
Date: 8/7/2019

REGENESIS

Project Info

O'Neal Clothes Depot Cleaners
Martinsville, IN
Dissolved Plume: Barrier B

Prepared For:
Wilcox

Target Treatment Zone (TTZ) Info	Unit	Value
Barrier Length	ft	120
Top Treat Depth	ft	9.0
Bot Treat Depth	ft	16.0
Vertical Treatment Interval	ft	7.0
Treatment Zone Volume	ft^3	12,600
Treatment Zone Volume	cy	467
Soil Type	---	sand
Porosity	cm^3/cm^3	0.33
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	31,104
Treatment Zone Effective Pore Volume	gals	18,851
Treatment Zone Pore Volume	liters	117741
Treatment Zone Effective Pore Volume	liters	71358
Fraction Organic Carbon (foc)	g/g	0.002
Soil Density	g/cm^3	1.7
Soil Density	lb/ft^3	108
Soil Weight	lbs	1.4E+06
Hydraulic Conductivity	ft/day	155.0
Hydraulic Conductivity	cm/sec	5.47E-02
Hydraulic Gradient	ft/ft	0.006
GW Velocity	ft/day	4.26
GW Velocity	ft/yr	1557

Application Dosing	Unit	Value
PlumeStop to be Applied	**lbs**	**4,000**
HRC to be Applied	**lbs**	**520**
BDI Plus to be Applied	**Liters**	**8**

PlumeStop® Application Design Summary

Dissolved Plume: Barrier B

PlumeStop	
Barrier Length (ft)	**120**
Spacing Within Barrier (ft)	10
Number of Lines	2
Application Points	**24**
Application Method	**Direct Push**
Top Application Depth (ft bgs)	9
Bottom Application Depth (ft bgs)	16
PlumeStop to be Applied (lbs)	**4,000**
PlumeStop to be Applied (gals)	444
AquaZVI to be added to PlumeStop (lbs)	0
AquaZVI to be added to PlumeStop (gals)	0
<u>PlumeStop Volume Totals</u>	
Mixing Water (gal)	11,543
Total Application Volume (gals)	**11,987**
Injection Volume per Point (gals)	499
Anaerobic Bioremediation - HRC	
HRC Application Points	**12**
HRC to be Applied (lbs)	**520**
HRC per point (lbs)	43
Total Application Volume (gals)	**48**
Injection Volume per Point (gals)	4.0
Bioaugmentation - BDI Plus	
BDI Plus Application Points	**12**
BDI Plus to be Applied (Liters)	**8**
BDI Plus per point (Liters)	0.7

Technical Notes/Discussion

Co-mix and inject 1,100 lbs of Calcium Chloride with PlumeStop

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

Prepared by: Owen Miller - Design Specialist
Date: 8/7/2019

REGENESIS

Project Info

O'Neal Clothes Depot Cleaners
Martinsville, IN
Dissolved Plume: Barrier C

Prepared For:
Wilcox

Target Treatment Zone (TTZ) Info	Unit	Value
Barrier Length	ft	170
Top Treat Depth	ft	12.0
Bot Treat Depth	ft	20.0
Vertical Treatment Interval	ft	8.0
Treatment Zone Volume	ft^3	20,400
Treatment Zone Volume	cy	756
Soil Type	---	sand
Porosity	cm^3/cm^3	0.33
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	50,359
Treatment Zone Effective Pore Volume	gals	30,521
Treatment Zone Pore Volume	liters	190628
Treatment Zone Effective Pore Volume	liters	115532
Fraction Organic Carbon (foc)	g/g	0.002
Soil Density	g/cm^3	1.7
Soil Density	lb/ft^3	108
Soil Weight	lbs	2.2E+06
Hydraulic Conductivity	ft/day	155.0
Hydraulic Conductivity	cm/sec	5.47E-02
Hydraulic Gradient	ft/ft	0.006
GW Velocity	ft/day	4.26
GW Velocity	ft/yr	1557

Application Dosing	Unit	Value
PlumeStop to be Applied	**lbs**	**6,000**
HRC to be Applied	**lbs**	**840**
BDI Plus to be Applied	**Liters**	**12**

PlumeStop® Application Design Summary

Dissolved Plume: Barrier C

PlumeStop	
Barrier Length (ft)	**170**
Spacing Within Barrier (ft)	10
Number of Lines	2
Application Points	**34**
Application Method	**Direct Push**
Top Application Depth (ft bgs)	12
Bottom Application Depth (ft bgs)	20
PlumeStop to be Applied (lbs)	**6,000**
PlumeStop to be Applied (gals)	666
AquaZVI to be added to PlumeStop (lbs)	0
AquaZVI to be added to PlumeStop (gals)	0
PlumeStop Volume Totals	
Mixing Water (gal)	17,315
Total Application Volume (gals)	**17,981**
Injection Volume per Point (gals)	529
Anaerobic Bioremediation - HRC	
HRC Application Points	**17**
HRC to be Applied (lbs)	**840**
HRC per point (lbs)	49
Total Application Volume (gals)	**77**
Injection Volume per Point (gals)	4.6
Bioaugmentation - BDI Plus	
BDI Plus Application Points	**17**
BDI Plus to be Applied (Liters)	**12**
BDI Plus per point (Liters)	0.7

Technical Notes/Discussion

Co-mix and inject 1,200 lbs of Calcium Chloride with PlumeStop

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

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Prepared by: Owen Miller - Design Specialist
Date: 8/7/2019

REGENESIS

Project Info

O'Neal Clothes Depot Cleaners
Martinsville, IN
Dissolved Plume: Barrier D

Prepared For:
Wilcox

Target Treatment Zone (TTZ) Info	Unit	Value
Barrier Length	ft	160
Top Treat Depth	ft	9.0
Bot Treat Depth	ft	16.0
Vertical Treatment Interval	ft	7.0
Treatment Zone Volume	ft^3	16,800
Treatment Zone Volume	cy	622
Soil Type	---	sand
Porosity	cm^3/cm^3	0.33
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	41,472
Treatment Zone Effective Pore Volume	gals	25,135
Treatment Zone Pore Volume	liters	156988
Treatment Zone Effective Pore Volume	liters	95144
Fraction Organic Carbon (foc)	g/g	0.002
Soil Density	g/cm^3	1.7
Soil Density	lb/ft^3	108
Soil Weight	lbs	1.8E+06
Hydraulic Conductivity	ft/day	155.0
Hydraulic Conductivity	cm/sec	5.47E-02
Hydraulic Gradient	ft/ft	0.006
GW Velocity	ft/day	4.26
GW Velocity	ft/yr	1557

Application Dosing	Unit	Value
PlumeStop to be Applied	**lbs**	**7,200**
HRC to be Applied	**lbs**	**680**
BDI Plus to be Applied	**Liters**	**10**

PlumeStop® Application Design Summary

Dissolved Plume: Barrier D

PlumeStop	
Barrier Length (ft)	**160**
Spacing Within Barrier (ft)	10
Number of Lines	2
Application Points	**32**
Application Method	**Direct Push**
Top Application Depth (ft bgs)	9
Bottom Application Depth (ft bgs)	16
PlumeStop to be Applied (lbs)	**7,200**
PlumeStop to be Applied (gals)	799
AquaZVI to be added to PlumeStop (lbs)	0
AquaZVI to be added to PlumeStop (gals)	0
PlumeStop Volume Totals	
Mixing Water (gal)	9,989
Total Application Volume (gals)	**10,789**
Injection Volume per Point (gals)	337
Anaerobic Bioremediation - HRC	
HRC Application Points	**16**
HRC to be Applied (lbs)	**680**
HRC per point (lbs)	43
Total Application Volume (gals)	**63**
Injection Volume per Point (gals)	3.9
Bioaugmentation - BDI Plus	
BDI Plus Application Points	**16**
BDI Plus to be Applied (Liters)	**10**
BDI Plus per point (Liters)	0.6

Technical Notes/Discussion

Co-mix and inject 2,000 lbs of Calcium Chloride with PlumeStop

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

Prepared by: Owen Miller - Design Specialist
Date: 8/7/2019

PLUME STOP
Liquid Activated Carbon

PlumeStop® Liquid Activated Carbon™ Technical Description

PlumeStop Liquid Activated Carbon is an innovative groundwater remediation technology designed to rapidly remove and permanently degrade groundwater contaminants. PlumeStop is composed of very fine particles of activated carbon (1-2µm) suspended in water through the use of unique organic polymer dispersion chemistry. Once in the subsurface, the material behaves as a colloidal biomatrix, binding to the aquifer matrix, rapidly removing contaminants from groundwater, and expediting permanent contaminant biodegradation.

This unique remediation technology accomplishes treatment with the use of highly dispersible, fast-acting, sorption-based technology, capturing and concentrating dissolved-phase contaminants within its matrix-like structure. Once contaminants are sorbed onto the regenerative matrix, biodegradation processes achieve complete remediation at an accelerated rate.

Distribution of PlumeStop in water

To see a list of treatable contaminants with the use of PlumeStop, view the Range of Treatable Contaminants Guide.

Chemical Composition

- Water - CAS# 7732-18-5
- Colloidal Activated Carbon ≤2.5 - CAS# µm 7440-44-0
- Proprietary Additives

Properties

- Physical state: Liquid
- Form: Aqueous suspension
- Color: Black
- Odor: Odorless
- pH: 8 - 10

Storage and Handling Guidelines

Storage
Store in original tightly closed container
Store away from incompatible materials
Protect from freezing

Handling
Avoid contact with skin and eyes
Avoid prolonged exposure
Observe good industrial hygiene practices
Wash thoroughly after handling
Wear appropriate personal protective equipment

PLUME STOP®
Liquid Activated Carbon

PlumeStop® Liquid Activated Carbon™ Technical Description

Applications

PlumeStop is easily applied into the subsurface through gravity-feed or low-pressure injection.

Health and Safety

Wash hands after handling. Dispose of waste and residues in accordance with local authority requirements. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: PlumeStop SDS.

REGENESIS

www.regenesis.com
1011 Calle Sombra, San Clemente CA 92673
949.366.8000

HYDROGEN RELEASE COMPOUND

HRC® Technical Description

Example of HRC

HRC® is an engineered, hydrogen release compound designed specifically for enhanced, in situ anaerobic bioremediation of chlorinated compounds in groundwater or highly saturated soils. Upon contact with groundwater, this viscous, polylactate ester material becomes hydrated and subject to microbial breakdown producing a controlled-release of hydrogen for periods of up to 18-24 months on a single application.

HRC enables enhanced anaerobic biodegradation by adding hydrogen (an electron donor) to groundwater and/or soil to increase the number and vitality of indigenous microorganisms able to perform the naturally occurring process of enhanced reductive dechlorination. During this process, certain naturally occurring microorganisms replace chlorine atoms on chlorinated contaminants with the newly available hydrogen effectively reducing the contaminant to a less harmful substance with the preferred and innocuous endpoints of ethene or ethane.

For a list of treatable contaminants with the use of HRC, view the Range of Treatable Contaminants Guide.

Chemical Composition

- Glycerol Tripolylactate- CAS #201167-72-8
- Glycerin- CAS #56-81-5
- Lactic acid- CAS #50-21-5

Properties

- pH - 3 (3% solution/water)
- Appearance – Viscous gel/liquid. Amber color
- Odor – Odorless
- Vapor Pressure – None

Storage and Handling Guidelines

Storage
Store away from incompatible materials
Store in original tightly closed container
Store in a cool, dry, well-ventilated place

Handling
Wash thoroughly after handling
Wear appropriate personal protective equipment
Wear eye/face protection
Provide adequate ventilation
Observe good industrial hygiene practices

HYDROGEN
RELEASE
COMPOUND

HRC® Technical Description

Applications

- Permanent injection wells
- Direct-push injection (barriers and grids)
- Recirculating wells
- Soil borings
- Excavation applications into soil or on top of bedrock
- Gravity feed into bedrock wells

Application instructions for this product are contained in the HRC Application Instructions.

Health and Safety

Avoid contact with eyes, skin, and clothing. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Please review the HRC Material Safety Data Sheet for additional storage, usage, and handling requirements.

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1011 Calle Sombra, San Clemente CA 92673
949.366.8000

BIO-DECHLOR INOCULUM

BDI PLUS® Technical Description

Bio-Dechlor INOCULUM Plus (BDI PLUS®) is an enriched natural consortium containing species of Dehalococcoides sp. (DHC). BDI PLUS has been shown to simulate the rapid and complete dechlorination of chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE) and vinyl chloride (VC) to non-toxic end products, ethene, carbon dioxide and water.

The culture also contains microbes capable of dehalogenating halomethanes (e.g., carbon tetrachloride and chloroform) and haloethanes (e.g., 1,1,1-TCA and 1,1-DCA) as well as mixtures of these contaminants.

Species of Dehalococcoides sp. (DHC)

For a list of treatable contaminants with the use of BDI PLUS, view the Range of Treatable Contaminants Guide

Chemical Composition

- Non-hazardous, naturally-occurring, non-altered anaerobic microbes and enzymes in a water-based medium.

Properties

- Appearance – Murky, yellow to grey water
- Odor – Musty
- pH 6.0 to 8.0
- Density – Approximately 1.0 grams per cubic centimeter (0.9 to 1.1 g/cc)
- Solubility – Soluble in Water
- Vapor Pressure – None
- Non-hazardous

Storage and Handling Guidelines

Storage
Store in original tightly closed container
Store away from incompatible materials
Recommended storage containers: plastic lined steel, plastic, glass, aluminum, stainless steel, or reinforced fiberglass
Store in a cool, dry area at 4-5°C (39 - 41°F)
Material may be stored for up to 3 weeks at 2-4°C without aeration

Handling
Avoid prolonged exposure
Observe good industrial hygiene practices
Wear appropriate personal protective equipment

BIO-DECHLOR INOCULUM

BDI PLUS® Technical Description

Applications

- BDI PLUS is delivered to the site in liquid form and is designed to be injected directly into the saturated zone requiring treatment.
- Most often diluted with de-oxygenated water prior to injection into either hydraulic push injection points or properly constructed injection wells.
- The typical dilution rate of the injected culture is 10 gallons of deoxygenated water to 1 liter of standard BDI PLUS culture.

Application instructions for this product are contained here BDI PLUS Application Instructions.

Health and Safety

Material is non-hazardous and relatively safe to handle; however avoid contact with eyes and prolonged contact with skin. OSHA Level D personal protection equipment including: vinyl or rubber gloves and safety goggles or a splash shield are recommended when handling this product. An eyewash station is recommended. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: BDI PLUS SDS.

REGENESIS

www.regenesis.com
1011 Calle Sombra, San Clemente CA 92673
949.366.8000

APPENDIX R

Draft Environmental Restrictive Covenant

Environmental Restrictive Covenant

THIS ENVIRONMENTAL RESTRICTIVE COVENANT ("Covenant") is made this ______ day of __________ 2019, by John M. and Margaret A. O'Neal (together with all successors and assignees, collectively "Owner").

WHEREAS: Owner is the fee owner of certain real estate in the County of Morgan, Indiana, 46151, which is located at 833 East Morgan Street and more particularly described in the attached Exhibit "A" ("Real Estate"), which is hereby incorporated and made a part hereof. This Real Estate was acquired by deed on September 28, 1993, and recorded on October 1, 1993, in Book #359 on Page #75, in the Office of the Recorder of Morgan County, Indiana. The Real Estate consists of approximately 0.2-acre and has also been identified by the state as parcel identification number 55-09-34-366-002.000-021. The Real Estate to which the restrictions in this Covenant apply is depicted on a map attached hereto as Exhibit "B".

WHEREAS: Corrective action was implemented in accordance with IC 13-25-4-5 and other applicable Indiana law as a result of a release of chlorinated solvents relating to the former O'Neal's Clothes Depot Cleaners facility located at 833 East Morgan Street, Martinsville, Indiana. The former O'Neal's Clothes Depot Cleaners facility was entered into the Indiana Department of Environmental Management ("Department" or "IDEM") State Cleanup Program (State Cleanup) in October 2014 and was assigned identification number 0000402.

WHEREAS: A certain contaminant of concern ("COC") remains in the groundwater and soil of the Real Estate following completion of corrective action. The Department has determined that the COC will not pose an unacceptable risk to human health at the remaining concentrations, provided that the land use restrictions contained herein are implemented to protect human health and the environment. The COC is tetrachloroethene.

WHEREAS: Environmental investigation reports and other related documents are hereby incorporated by reference and may be examined at the offices of the Department, which is located in the Indiana Government Center North building at 100 N. Senate Avenue, Indianapolis, Indiana. The documents may also be viewed electronically in the Department's Virtual File Cabinet by accessing the Department's Web Site (currently www.in.gov/idem/).

NOW THEREFORE, John M. and Margaret A. O'Neal subjects the Real Estate to the following restrictions and provisions, which shall be binding on the current Owner and all future Owners:

I. RESTRICTIONS

1. Restrictions. The Owner:

   (a) Shall not use or allow the use of the Real Estate for residential purposes, including, but not limited to, daily child care facilities or educational facilities for children (e.g., daycare centers or K-12 schools).

   (b) Shall not use or allow the use or extraction of groundwater at the Real Estate for any purpose, including, but not limited to: human or animal consumption, gardening, industrial processes, or agriculture, except that groundwater may be extracted in conjunction with environmental investigation and/or remediation activities.

II. GENERAL PROVISIONS

2. Restrictions to Run with the Land. The restrictions and other requirements described in this Covenant shall run with the land and be binding upon, and inure to the benefit of the Owner of the Real Estate and the Owner's successors, assignees, heirs and lessees and their authorized agents, employees, contractors, representatives, agents, lessees, licensees, invitees, guests, or persons acting under their direction or control (hereinafter "Related Parties") and shall continue as a servitude running in perpetuity with the Real Estate. No transfer, mortgage, lease, license, easement, or other conveyance of any interest in or right to occupancy in all or any part of the Real Estate by any person shall affect the restrictions set forth herein. This Covenant is imposed upon the entire Real Estate unless expressly stated as applicable only to a specific portion thereof.

3. Binding upon Future Owners. By taking title to an interest in or occupancy of the Real Estate, any subsequent Owner or Related Party agrees to comply with all of the restrictions set forth in paragraph 1 above and with all other terms of this Covenant.

4. Access for Department. The Owner shall grant to the Department and its designated representatives the right to enter upon the Real Estate at reasonable times for the purpose of monitoring compliance with this Covenant and ensuring its protectiveness; this right includes the right to take samples and inspect records

5. Written Notice of the Presence of Contamination. Owner agrees to include in any instrument conveying any interest in any portion of the Real Estate, including but not limited to deeds, leases and subleases (excluding mortgages, liens, similar financing interests, and other non-possessory encumbrances), the following notice provision (with blanks to be filled in):

   NOTICE: THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL RESTRICTIVE COVENANT, DATED___________ 2019, RECORDED IN THE OFFICE OF THE RECORDER OF MORGAN COUNTY ON _________________, 2019, INSTRUMENT NUMBER (or other identifying reference) ________________ IN FAVOR OF AND ENFORCEABLE BY THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT.

6. Notice to Department of the Conveyance of Property. Owner agrees to provide notice to the Department of any conveyance (voluntary or involuntary) of any ownership interest in the Real Estate (excluding mortgages, liens, similar financing interests, and other non-possessory encumbrances). Owner must provide the Department with the notice within thirty (30) days of the conveyance and: (a) include a certified copy of the instrument conveying any interest in any portion of the Real Estate, and (b) if it has been recorded, its recording reference, and (c) the name and business address of the transferee.

7. Indiana Law. This Covenant shall be governed by, and shall be construed and enforced according to, the laws of the State of Indiana.

III. ENFORCEMENT

8. Enforcement. Pursuant to IC 13-14-2-6 and other applicable law, the Department may proceed in court by appropriate action to enforce this Covenant. Damages alone are insufficient to compensate IDEM if any owner of the Real Estate or its Related Parties breach this Covenant or otherwise default hereunder. As a result, if any owner of the Real Estate, or any owner's Related Parties, breach this Covenant or otherwise default hereunder, IDEM shall have the right to request specific performance and/or immediate injunctive relief to enforce this Covenant in addition to any other remedies it may have at law or at equity. Owner agrees that the provisions of this Covenant are enforceable and agrees not to challenge the provisions or the appropriate court's jurisdiction.

IV. TERM, MODIFICATION AND TERMINATION

9. Term. The restrictions shall apply until the Department determines that the contaminants of concern no longer present an unacceptable risk to the public health, safety, or welfare, or to the environment.

10. Modification and Termination. This Covenant shall not be amended, modified, or terminated without the Department's prior written approval. Within thirty (30) days of executing an amendment, modification, or termination of the Covenant, Owner shall record such amendment, modification, or termination with the Office of the Recorder of Morgan County and within thirty (30) days after recording, provide a true copy of the recorded amendment, modification, or termination to the Department.

V. MISCELLANEOUS

11. Waiver. No failure on the part of the Department at any time to require performance by any person of any term of this Covenant shall be taken or held to be a waiver of such term or in any way affect the Department's right to enforce such term, and no waiver on the part of the Department of any term hereof shall be taken or held to be a waiver of any other term hereof or the breach thereof.

12. Conflict of and Compliance with Laws. If any provision of this Covenant is also the subject of any law or regulation established by any federal, state, or local government, the strictest standard or requirement shall apply. Compliance with this Covenant does not relieve the Owner of its obligation to comply with any other applicable laws.

13. Change in Law, Policy or Regulation. In no event shall this Covenant be rendered unenforceable if Indiana's laws, regulations, RCG guidelines, or remediation policies (including those concerning environmental restrictive covenants, or institutional or engineering controls) change as to form or content. All statutory references include any successor provisions.

14. Notices. Any notice, demand, request, consent, approval or communication that either party desires or is required to give to the other pursuant to this Covenant shall be in

writing and shall either be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Owner:
John M. and Margaret A. O'Neal
1007 Plaza Drive
Martinsville, Indiana 46151

With a copy to:
David Guevara, Ph.D.
Taft, Stettinius & Hollister LLP
One Indianapolis Square, Suite 3500
Indianapolis, Indiana 46204-2023

To Department:
IDEM, Office of Land Quality
100 N. Senate Avenue
IGCN 1101
Indianapolis, IN 46204-2251
Attn: Section Chief, State Cleanup Program

An Owner may change its address or the individual to whose attention a notice is to be sent by giving written notice via certified mail.

15. Severability. If any portion of this Covenant or other term set forth herein is determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions or terms of this Covenant shall remain in full force and effect as if such portion found invalid had not been included herein.

16. Authority to Execute and Record. The undersigned person executing this Covenant represents that he or she is the current fee Owner of the Real Estate or is the authorized representative of the Owner, and further represents and certifies that he or she is duly authorized and fully empowered to execute and record, or have recorded, this Covenant.

Owner hereby attests to the accuracy of the statements in this document and all attachments.

IN WITNESS WHEREOF, John M. and Margaret A. O'Neal, the said Owner of the Real Estate described above has caused this Environmental Restrictive Covenant to be executed on this _______ day of ________________________, 2019.

____

John M. O'Neal

____

Margaret A. O'Neal

STATE OF ______________)
) SS:
COUNTY OF ____________)

Before me, the undersigned, a Notary Public in and for said County and State, personally appeared _________________, the _________________ of the Owner, ________________________, who acknowledged the execution of the foregoing instrument for and on behalf of said entity.

Witness my hand and Notarial Seal this ___ day of ___________, 20___.

____

______________________________, Notary Public

Residing in _______________ County, ________

My Commission Expires:

This instrument prepared by:
Jeremy S. Kinman, LPG, PG
Wilcox Environmental Engineering, Inc.

I affirm, under the penalties for perjury, that I have taken reasonable care to redact each Social Security number in this document, unless required by law:

Jeremy S. Kinman, LPG, PG
Wilcox Environmental Engineering, Inc.
1552 Main Street, Suite 100
Speedway, Indiana 46224

EXHIBIT A

DEED AND LEGAL DESCRIPTION OF REAL ESTATE

7.00

9311590

Form No. 6

Parcel No. ______________

CORPORATE WARRANTY DEED

THIS INDENTURE WITNESSETH, That Ginroh Inc. (Grantor), a corporation organized and existing under the laws of the State of Indiana CONVEYS AND WARRANTS to John M. O'Neal and Margaret A. O'Neal, husband and wife (Grantee) of Morgan County, in the State of Indiana, for the sum of One -- Dollars ($ 1.00) and other valuable consideration, the receipt of which is hereby acknowledged, the following described real estate in Morgan County, in the State of Indiana:

A part of the Southwest quarter of the Southwest quarter of Section 34, Township 12 North, Range 1 East, described as follows, to-wit:

Beginning on the South line of Morgan Street in the Town (now City) of Martinsville, 66 feet East of the East line of Colfax Street and running thence South 132 feet; thence East 66 feet, thence North 132 feet, thence West 66 feet to the place of beginning.

Subject to all restrictions, easements and/or rights of way of record.

Grantor certifies under oath that no Indiana Adjusted Gross Income Tax is due as a result of this conveyance.

This conveyance terminates a certain unrecorded land contract by and between Ginrho Inc., as Seller and John M. O'Neal and Margaret A. O'Neal, purchasers in an unrecorded land contract.

DULY ENTERED FOR TAXATION
Brenda Brittain
AUDITOR MORGAN COUNTY
OCT 1 1993

Subject to any and all easements, agreements and restrictions of record. The address of such real estate is commonly known as ______________

Tax bills should be sent to Grantee at such address unless otherwise indicated on the back.

The undersigned persons executing this deed on behalf of Grantor represent and certify that they are duly elected officers of Grantor and have been fully empowered, by proper resolution of the Board of Directors of Grantor, to execute and deliver this deed; that Grantor has full corporate capacity to convey the real estate described herein; and that all necessary corporate action for the making of such conveyance has been taken and done.

IN WITNESS WHEREOF, Grantor has executed this deed this 28th day of September, 1993.

Ginroh Inc.
(Name of Corporation)

(SEAL) ATTEST:

By ______________
Signature

____
Printed Name, and Office

By Virginia L. Watts
Signature
Virginia L. Watts, President
Printed Name, and Office

RECEIVED FOR RECORD Oct. 1 1993 at 1:51 P.m.
Vickie Kivett
MORGAN COUNTY RECORDER

STATE OF INDIANA
COUNTY OF MORGAN SS:

Before me, a Notary Public in and for said County and State, personally appeared ______________ and Virginia L. Watts, the ______________ and President, respectively of ______________ and Ginroh Inc., who acknowledged execution of the foregoing Deed for and on behalf of said Grantor, and who, having been duly sworn, stated that the representations therein contained are true.

Witness my hand and Notarial Seal this 28th day of September, 1993.

My commission expires: 7/16/97

Signature Kitsy D Carpenter
Printed Kitsy D. Carpenter, Notary Public
Resident of Morgan County, Indiana.

NOTARY PUBLIC SEAL INDIANA

This instrument prepared by Phillip R. Smith, Attorney at Law.
Send Tax Bills to: 139 Woodcrest, Martinsville, IN 46151

EXHIBIT B

MAP OF REAL ESTATE

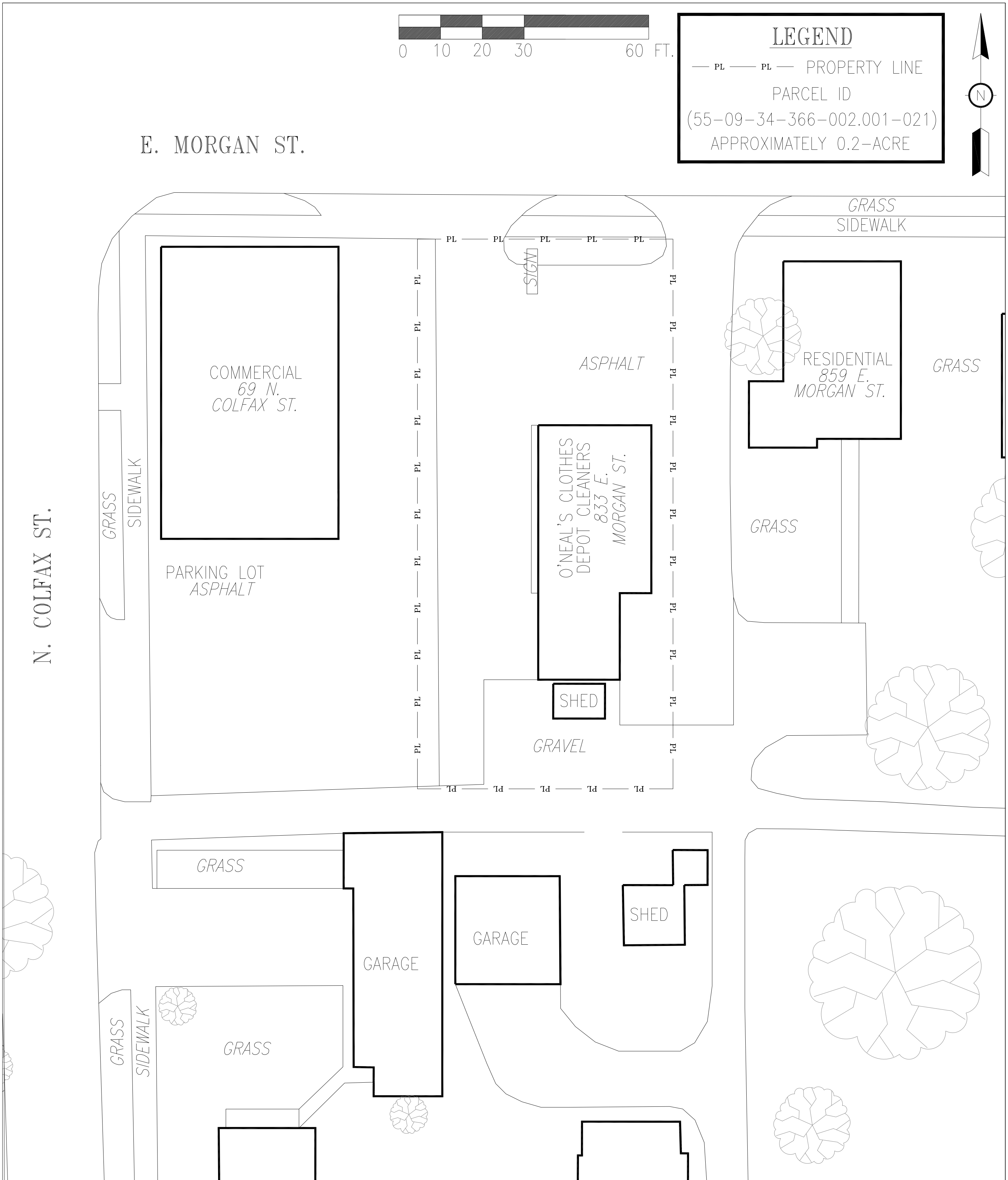

EXHIBIT B
ENVIRONMENTAL RESTRICTIVE COVENANT

FORMER O'NEALS CLOTHES DEPOT CLEANERS
833 EAST MORGAN STREET, MARTINSVILLE, IN

WILCOX
ENVIRONMENTAL ENGINEERING

WILCOX PROJECT # 341.14	SCALE 1" = 30'
PROJECT MANAGER J. KINMAN	DATE 10/30/19
FILE NO. 34114002	FIGURE NO. –