Attachment C
Waste Characteristics/Waste Analysis Plan

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C. WASTE CHARACTERISTICS

C-1 Chemical and Physical Analysis

Hazardous wastes currently generated at the Midwest Plant are summarized in **Table B-1a** in Attachment B of the Permit. The F006 hazardous waste code is the primary hazardous waste that may be disposed in the Greenbelt II Landfill. As of the date of the Permit, both the F006 and other hazardous wastes produced at the facility are disposed off-site. The F006 hazardous wastes generated at the Midwest Plant are classified as nonwastewaters. As noted in Section C-1d, possible hazardous and nonhazardous wastes encountered at Solid Waste Management Units (SWMUs) may be disposed in the Greenbelt II Landfill, if results of the RCRA Facility Investigation (RFI) require soil excavation and disposal.

The remainder of the dilute hazardous waste streams, including nonhazardous streams, are directed to the facility's wastewater treatment system (NPDES permit IN 0000337) or are disposed off-site. A schematic of the various waste stream generating operations and management methods is provided in **Figure B-2** in Attachment B of the Permit.

C-1a Containerized Waste

No hazardous wastes are managed in containers for greater than 90 days at the Midwest Plant. Therefore, this section does not apply.

C-1b Waste in Tank Systems

No hazardous wastes are managed in tanks for greater than 90 days at the Midwest Plant. Therefore, this section does not apply.

C-1c Waste in Piles

No hazardous wastes are managed in Waste Piles at the Midwest Plant. Therefore, this section does not apply.

C-1d Landfilled Wastes

Wastes that may be placed in the Greenbelt II Landfill may include wastes from the following general categories:

1. Hazardous Waste;
2. Nonhazardous Waste; or

3. Active or inactive Solid Waste Management Unit (SWMU) Remediation Wastes.

Hazardous waste that may be disposed in the Greenbelt II Landfill includes wastewater treatment sludge (EPA Hazardous Waste No. F006) from the Chrome Treatment Plant that has been dewatered and possibly F006 contaminated soils and debris. Various chromium-bearing wastewaters are routed to the Chrome Treatment Plant, then reduced from hexavalent chromium to trivalent chromium (chrome reduction). Then, the Chrome Treatment Plant employs chemical precipitation to remove metals from the wastewater. Precipitate generated by the chemical precipitation process is pumped to a mechanical dewatering system to be pressed into a filter cake. The filter cake is collected, then transported to the Greenbelt II Landfill or transported off-site for appropriate management.

Pursuant to 40 C.F.R. § 264.314(b) and 329 I.A.C. § 3.1-9-1, materials disposed in the Greenbelt II Landfill must pass the paint filter test prior to land disposal. Since the installation of the mechanical dewatering equipment, there has been no issue with the filter cake passing the paint filter test. If a malfunction or other process change is identified in the mechanical dewatering equipment, then testing for free liquids will be instituted until the malfunction or process change is corrected. Representative results from past analytical testing are provided in **Appendix C-1** of the Permit, including data from 2021-2023. Historical data obtained prior to 2021 is on file at the facility, and available for review, upon request.

Nonhazardous wastes that may also be disposed in the Greenbelt II Landfill include wastes listed on **Table B-1b** in Attachment B of this Permit.

Possible hazardous and nonhazardous wastes encountered at SWMUs may be disposed in the Greenbelt II Landfill, if results of the RFI require soil excavation and disposal. A description of the existing SWMUs is provided in Attachment J of this Permit. If waste from other SWMUs is disposed in the Greenbelt II Landfill, the materials will be adequately characterized prior to disposal. The land ban requirements would apply, if the waste is classified as hazardous under RCRA.

C-1e Wastes Incinerated and Wastes Used in Performance Tests

No hazardous wastes are incinerated or used in performance tests at the Midwest Plant. Therefore, this section does not apply.

C-1f Wastes to be Land Treated

No hazardous wastes are to be land treated at the Midwest Plant. Therefore, this section does not apply.

C-1g Wastes in Miscellaneous Treatment Units

No hazardous wastes are stored in miscellaneous treatment units at the Midwest Plant. Therefore, this section does not apply.

C-1h Wastes in Boilers and Industrial Furnaces

No hazardous wastes are managed in boilers or industrial furnaces at the Midwest Plant. Therefore, this section does not apply.

C-2 Waste Analysis Plan

A Waste Analysis Plan (WAP) has been developed describing methodologies for conducting the analyses required to properly dispose of hazardous wastes in the Greenbelt II Landfill and to comply with the land disposal restriction program. The WAP will be implemented whenever F006 hazardous waste is disposed in the Greenbelt II Landfill. Specifically, the WAP complies with 40 CFR 270.14(b)(3), 264.13(b) and (c), 266.102(a)(2)(ii), 266.104(a)(2), and 268.7. The WAP, provided as **Appendix C-2**, describes the following key elements:

1. Description of the facility;
2. Selection of waste analysis parameters;
3. Selection of sampling procedures;
4. Selection of a laboratory and testing and analytical methods; and
5. Selection of waste re-evaluation frequencies.

The laboratory calibration procedures, TCLP procedures, data reduction and reporting forms and laboratory quality control are discussed in the WAP Quality Assurance Project Plan (provided as Exhibit A to the WAP, **Appendix C-2**).

C-2a Parameters and Rationale

See Section 3.0 of the WAP located in **Appendix C-2**.

C-2b Test Methods

See Section 5.0 of the WAP located in **Appendix C-2**.

C-2c Sampling Methods

See Section 4.0 of the WAP located in **Appendix C-2**.

C-2d Frequency of Analysis

See Section 6.0 of the WAP located in **Appendix C-2**.

C-2e Additional Requirements for Wastes Generated Off-Site

No hazardous wastes are disposed of in the Greenbelt II Landfill that are generated off-site. Therefore, this section does not apply.

C-2f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

No ignitable, reactive or incompatible hazardous wastes are generated at the Midwest Plant. Therefore, this section does not apply.

C-2g Additional Requirements Pertaining to Boiler and Industrial Furnace Facilities

The Midwest Plant is not a boiler or industrial furnace facility. Therefore, this section does not apply.

C-2h Additional Requirements Pertaining to Containment Buildings

No hazardous wastes are stored in containment buildings located at the Midwest Plant. Therefore, this section does not apply.

C-3 Waste Analysis Requirements Pertaining to Land Disposal Restrictions

C-3a Waste Analysis

C-3a(1) Spent Solvent and Dioxin Wastes

No spent solvent or dioxin hazardous wastes are managed at the Midwest Plant. Therefore, this section does not apply.

C-3a(2) California List Wastes

No California list hazardous wastes are managed at the Midwest Plant. Therefore, this section does not apply.

C-3a(3) Listed Wastes

Listed hazardous wastes that may be placed in the Greenbelt II Landfill will include chrome treatment sludge (EPA Hazardous Waste No. F006) from the Chrome Treatment Plant that has been dewatered and possibly F006 contaminated soils and debris. In addition to the F006 filter cake generated from routine operations, additional wastes may be disposed of in the Greenbelt II Landfill, as described previously in Section C-1d.

Parameters analyzed for and the analytical methods followed for purposes of waste analysis are given in **Table C-2** and Section 1.0 of the WAP Quality Assurance Project Plan at Exhibit A to **Appendix C-2**. Cadmium, chromium (total), lead, nickel, silver and cyanide (total and amenable) were selected because they are the F006 Land Disposal Restriction (LDR) constituents and can reasonably be expected to be found in the filter cake.

For direct constituent analysis of the filter cake, acid digestion (SW-846 Method 3050) of samples is performed prior to analysis of the digestate, where appropriate. The TCLP (USEPA Method 1311) is employed as the extraction procedure for the filter cake. See **Table C-1** for a summary of the monthly TCLP and total cyanide analyses of filter cake from the filter presses. The laboratory analytical reports from 2021-2023 are presented in **Appendix C-1**. Historical data obtained prior to 2021 is on file at the facility, and available for review upon request.

If the F006 filter cake is not disposed in the Greenbelt II Landfill, but rather is transported off-site for appropriate management, then regular monthly laboratory analysis of the filter cake as described above is not required, unless it is needed to comply with the waste characterization requirements of the off-site facility.

C-3a(4) Characteristic Wastes

No characteristic hazardous wastes are currently managed at the Greenbelt II Landfill. However, it is possible that characteristically hazardous wastes may be generated for disposal within the Greenbelt II Landfill as a result of SWMU corrective action activities (see Attachment J for discussion of the SWMUs). Such disposal would occur in accordance with the approved RFI Workplans for SWMUs within the facility.

C-3a(5) Radioactive Mixed Waste

No radioactive mixed hazardous wastes are managed at the Midwest Plant. Therefore, this section does not apply.

C-3a(6) Leachates

Leachate and contact storm water from the Greenbelt II Landfill will be collected and managed appropriately. The leachate and contact storm water is collected and piped to the Chrome Treatment Plant for treatment.

C-3a(7) Lab Packs

No lab packs are managed at the Greenbelt II Landfill. Therefore, this section does not apply.

C-3a(8) Contaminated Debris

If generated, F006 contaminated soils and debris or non-hazardous materials from facility SWMUs can be disposed in the Greenbelt II Landfill.

C-3a(9) Waste Mixtures and Wastes with Overlapping Requirements

No waste mixtures or waste with overlapping requirements are managed at the Midwest Plant. Therefore, this section does not apply.

C-3a(10) Dilution and Aggregation of Wastes

No dilution or aggregation of wastes occur at the Midwest Plant. Therefore, this section does not apply.

C-3b Notification, Certification, and Recordkeeping Requirements

C-3b(1) Retention of Generator Notices and Certifications

The permittee is the initial generator of wastes disposed in the Greenbelt II Landfill. The permittee will comply with the land disposal restrictions as detailed in its Waste Analysis Plan (WAP). When the F006 filter cake is disposed at the Greenbelt II Landfill, samples of F006 sludge will be analyzed on a monthly basis and compared to the land treatment standards presented in **Table C-3**.

C-3b(2) Notification and Certification Requirements for Treatment Facilities

The Midwest Plant is not a land treatment facility. Therefore, this section does not apply. However, the permittee does mix the F006 filter cake from the filter presses with solidification agents after the filter cake is transported to the Greenbelt II Landfill. This process is referred to as solidification. The solidification process increases the physical strength properties for compaction and stability. This is a physical process and not a chemical (i.e., treatment) process.

Treatment is not needed at the Greenbelt II Landfill because when the F006 filter cake is transported to the landfill, it has been previously tested and found to be in compliance with the best demonstrated available technology (BDAT) LDR treatment standards and passes the paint filter test (see WAP in **Appendix C-2**).

C-3b(3) Notification and Certification Requirements for Land Disposal Facilities

The permittee does not accept hazardous waste from off site for disposal in the Greenbelt II Landfill. Therefore, the permittee is the initial generator of the waste, and will not receive notices and certifications from offsite generators. Therefore, this section does not apply.

C-3b(4) Wastes Shipped to Subtitle C Facilities

The permittee has historically shipped hazardous wastes generated within the Midwest Plant to off-site Subtitle C facilities, including the F006 filter cake generated at the chrome treatment plant. The permittee will continue to have the option of managing the F006 filter cake at an off-site facility, as an alternative to disposal within the Greenbelt II Landfill.

C-3b(5) Wastes Shipped to Subtitle D Facilities

The permittee does not ship hazardous wastes that have been treated to remove the hazardous characteristic to Subtitle D facilities. Therefore, this section does not apply.

C-3b(6) Recyclable Materials

No recyclable materials are handled or stored at the Greenbelt II Landfill. Therefore, this section does not apply.

C-3b(7) Recordkeeping

When the F006 filter cake is being disposed at the Greenbelt II Landfill, the permittee will test a representative sample of F006 waste to assess compliance with land disposal restrictions as detailed in the WAP. The waste analysis data will be retained in the facility's files for a minimum of three years from the date of analysis, unless the permittee is specifically requested by IDEM to retain the data for a longer time period.

C-3c Requirements Pertaining to the Storage of Restricted Wastes

C-3c(1) Restricted Wastes Stored in Containers

No restricted wastes are generated at the Greenbelt II Landfill. Therefore, this section does not apply.

C-3c(2) Restricted Wastes Stored in Tanks

No restricted wastes are generated at the Greenbelt II Landfill. Therefore, this section does not apply.

C-3c(3) Storage of Liquid PCB Wastes

No liquid PCB wastes are generated or stored at the Greenbelt II Landfill. Therefore, this section does not apply.

C-3d Exemptions, Extensions, and Variances to Land Disposal Restrictions

The permittee is not seeking any exemptions, extensions, or variances to the land disposal restrictions. Therefore, Sections C-3d(1) through (4) are not applicable.

Attachment C – Waste Characteristics/Waste Analysis Plan

TABLES

Table C-1
Summary of Monthly TCLP and Cyanide Analyses

North Filter Press

Constituent	Units	LDR Treatment Standard (mg/L)*	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Arsenic	mg/L	---	---	<0.0019	0.0038 J	0.0036 J	0.0023 J		---	0.0041 J	---	0.003 J	0.0045 J	---	<0.016
Barium	mg/L	---	---	0.08	0.085	0.088	0.06	---	---	0.29	---	0.085	0.085	---	0.076
Cadmium	mg/L	0.11	---	<0.0015	<0.0015	<0.0015	<0.0015	---	---	<0.0015	---	<0.0015	<0.0015	---	<0.0078
Chromium	mg/L	0.60	---	<0.012	<0.012	<0.012	0.05 J	---	---	<0.012	---	<0.012	<0.012	---	<0.0093
Lead	mg/L	0.75	---	<0.0072	<0.0072	0.017 J	<0.0072	---	---	<0.0072	---	<0.0072	<0.0072	---	<0.013
Mercury	mg/L	---	---	<0.0016	<0.0016	<0.0016	<0.0016	---	---	<0.0016	---	<0.0016	<0.0016	---	<0.0016
Nickel	mg/L	11	---	0.05 J	0.045 J	0.045 J	0.083	---	---	0.25	---	0.043 J	0.029 J	---	0.035 J
Selenium	mg/L	---	---	0.0088 J	<0.0048	<0.0048	<0.0048	---	---	0.0049 J	---	0.005 J	<0.0048	---	<0.032
Silver	mg/L	0.14	---	<0.0084	<0.0084	<0.0084	<0.0084	---	---	<0.0084	---	<0.0084	<0.0084	---	<0.025
Cyanide, Total	mg/kg	590 mg/kg	---	0.032	0.013 J	<0.012	0.014 J	---	---	0.039	---	0.11	0.066	---	---
Cyanide, Amenable	mg/kg	30 mg/kg	---	0.032	<0.013	<0.012	<0.013	---	---	<0.013	---	0.03 J	0.061	---	---

Note: Samples analyzed by ALS Environmental
*Source: 40 CFR 268.40(j), dated 2020.

South Filter Press

Constituent	Units	LDR Treatment Standard (mg/L)*	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Arsenic	mg/L	---	<0.0019	---	---	---	---	0.0027 J	0.0049 J	0.0047 J	0.0058 J	0.0038 J	---	0.0024 J	---
Barium	mg/L	---	0.058	---	---	---	---	0.11	0.068	0.13	0.58	0.021 J	---	0.07	---
Cadmium	mg/L	0.11	<0.0015	---	---	---	---	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	---	<0.0015	---
Chromium	mg/L	0.60	<0.012	---	---	---	---	<0.012	0.013 J	<0.012	0.012	0.016 J	---	<0.012	---
Lead	mg/L	0.75	<0.0072	---	---	---	---	<0.0072	<0.0072	<0.0072	<0.0072	<0.0072	---	<0.0072	---
Mercury	mg/L	---	<0.0016	---	---	---	---	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	---	<0.0016	---
Nickel	mg/L	11	0.047 J	---	---	---	---	0.04 J	0.047 J	0.1	0.44	0.036 J	---	0.041 J	---
Selenium	mg/L	---	0.011 J	---	---	---	---	0.0066 J	<0.0048	<0.0048	<0.0048	<0.0048	---	<0.0048	---
Silver	mg/L	0.14	<0.0084	---	---	---	---	<0.0084	<0.0084	<0.0084	<0.0084	<0.0084	---	<0.0084	---
Cyanide, Total	mg/kg	590 mg/kg	0.17	---	---	---	---	<0.013	0.27	0.13 J	0.15	0.045	---	0.059	---
Cyanide, Amenable	mg/kg	30 mg/kg	0.15	---	---	---	---	<0.013	<0.062	<0.013	0.06	0.025 J	---	<0.013	---

Note: Samples analyzed by ALS Environmental.
*Source: 40 CFR 268.40(j), dated 2020.

Table C-1
Summary of Monthly TCLP and Cyanide Analyses

North Filter Press

Constituent	Units	LDR Treatment Standard (mg/L)*	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23
Arsenic	mg/L	---	<0.016	---	---	---	<0.016	<0.016	---	---	<0.016	---	<0.016	<0.016	<0.016
Barium	mg/L	---	0.088	---	---	---	0.071	0.061	---	---	0.06	---	<0.043	0.084	<0.043
Cadmium	mg/L	0.11	<0.0078	---	---	---	<0.0078	<0.0078	---	---	<0.0078	---	<0.0078	<0.0078	<0.0078
Chromium	mg/L	0.6	<0.0093	---	---	---	0.019 J	0.03 J	---	---	<0.0093	---	0.01 J	<0.0093	0.026 J
Lead	mg/L	0.75	<0.013	---	---	---	<0.013	<0.013	---	---	<0.013	---	<0.013	<0.013	<0.013
Mercury	mg/L	---	<0.0016	---	---	---	<0.0016	<0.0016	---	---	<0.0016	---	<0.0016	<0.0016	<0.0016
Nickel	mg/L	11	0.041 J	---	---	---	0.063	0.036 J	---	---	0.042 J	---	0.049 J	0.037 J	0.042 J
Selenium	mg/L	---	0.04 J	---	---	---	<0.032	<0.032	---	---	<0.032	---	0.037 J	<0.032	<0.032
Silver	mg/L	0.14	<0.025	---	---	---	<0.025	<0.035 J	---	---	<0.025	---	<0.025	<0.025	<0.025
Cyanide, Total	mg/kg	590 mg/kg	9.8	---	---	---	0.1	<0.013	---	---	0.039	---	<0.029	0.03	<0.029
Cyanide, Amenable	mg/kg	30 mg/kg	0.89	---	---	---	0.046	<0.013	---	---	<0.013	---	<0.029	<0.029	<0.029

Note: Samples analyzed by ALS Environmental
*Source: 40 CFR 268.40(j), dated 2020.

South Filter Press

Constituent	Units	LDR Treatment Standard (mg/L)*	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23
Arsenic	mg/L	---	---	<0.016	<0.016	<0.016	---	---	<0.016	<0.016	---	<0.016	---	---	---
Barium	mg/L	---	---	<0.043	0.044 J	0.11	---	---	0.16	<0.043	---	0.09	---	---	---
Cadmium	mg/L	0.11	---	<0.0078	0.011 J	<0.0078	---	---	<0.0078	<0.0078	---	<0.0078	---	---	---
Chromium	mg/L	0.6	---	0.019 J	<0.0093	0.02 J	---	---	<0.0093	<0.0093	---	0.012 J	---	---	---
Lead	mg/L	0.75	---	<0.013	<0.013	<0.013	---	---	<0.013	<0.013	---	<0.013	---	---	---
Mercury	mg/L	---	---	<0.0016	<0.0016	<0.0016	---	---	<0.0016	<0.0016	---	<0.0016	---	---	---
Nickel	mg/L	11	---	0.082	0.082	0.061	---	---	0.061	0.041 J	---	0.039 J	---	---	---
Selenium	mg/L	---	---	0.044 J	<0.032	<0.032	---	---	<0.032	<0.032	---	0.041 J	---	---	---
Silver	mg/L	0.14	---	<0.025	<0.025	<0.025	---	---	<0.025	<0.025	---	<0.025	---	---	---
Cyanide, Total	mg/kg	590 mg/kg	---	<0.014	0.062	0.046	---	---	0.032	<0.012	---	0.046	---	---	---
Cyanide, Amenable	mg/kg	30 mg/kg	---	<0.014	<0.013	0.015 J	---	---	<0.013	<0.012	---	<0.013	---	---	---

Note: Samples analyzed by ALS Environmental
*Source: 40 CFR 268.40(j), dated 2020.

TABLE C-2
PARAMETERS AND METHODS FOR
MONTHLY TCLP ANAYSIS OF STABLIZED FILTER CAKE
FROM FILTER PRESS

Parameter	SW-846[1] Reference
Cadmium	6010D/6020B
Chromium (total)	6010D/6020B
Nickel	6010D/6020B
Lead	6010D/6020B
Silver	6010D/6020B
Total Cyanide	9012B
Amenable Cyanide	9012B

[1] "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods" (SW-846), Third Edition or currently recognized analytical method.

TABLE C-3

BDAT LDR Treatment Standards for F006 Nonwastewaters

Constituent	Waste Extract (milligrams/liter)	Total Constituent (milligrams/kg)
Cadmium	0.11 mg/l	Not Applicable
Chromium (total)	0.60 mg/l	Not Applicable
Lead	0.75 mg/l	Not Applicable
Nickel	11.0 mg/l	Not Applicable
Silver	0.14 mg/l	Not Applicable
Total Cyanide	Not Applicable	590 mg/kg
Amenable Cyanide	Not Applicable	30 mg/kg

Notes:
Based on 40 CFR 268.40(j), as of July 1, 2012.
If BDAT LDR Treatment Standards are modified in the future, most current standaards will be utilized.

APPENDIX C-1

TCLP Analytical Testing

See VFC Document # 83546904, pages 243 – 563

APPENDIX C-2

Waste Analysis Plan (WAP)

WASTE ANALYSIS PLAN
UNITED STATES STEEL CORPORATION – MIDWEST PLANT

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1.0 INTRODUCTION

This Waste Analysis Plan (WAP) for the Greenbelt II Landfill at United States Steel Corporation – Midwest Plant (Midwest Plant) in Portage, Indiana has been prepared in accordance with 40 CFR 270.14(b)(3), 264.13(b) and (c), 266.102(a)(2)(ii), 266.104(a)(2), and 268.7. This Plan describes the methodologies for conducting the analysis required to properly dispose of hazardous wastes in the Greenbelt II Landfill in compliance with the Land Disposal Restrictions (LDR) program. The WAP addresses the following:

1. Description of the Midwest Plant;
2. Selection of waste analysis parameters;
3. Selection of sampling procedures;
4. Selection of a laboratory for testing and analytical methods; and
5. Selection of waste re-evaluation frequencies.

The laboratory calibration procedures, TCLP procedures, data reduction and reporting forms and laboratory quality control procedures are discussed in the Waste Analysis Plan Quality Assurance Project Plan, provided as Exhibit A to this WAP.

2.0 FACILITY DESCRIPTION

This section provides a general description of the facilities and operations at the Midwest Plant. Specifically, this section addresses the following:

1. Description of the processes and activities used to generate or manage the wastes;
2. Identification/classification and quantities of hazardous wastes generated and managed; and
3. Description of the hazardous waste units.

2.1 Description of Facility Processes and Activities

The United States Steel Corporation is predominantly a steel manufacturing company. The Midwest Plant is a steel finishing facility located in Portage, Indiana. Raw product in the form of hot rolled coils is received from other facilities and subjected to supplemental processing. No basic steel production takes place at the Midwest Plant.

Most of the raw product is processed through the Continuous Pickle Line and one of two Cold Reduction Mills. Continuous pickling with hydrochloric acid removes the oxides deposited on the steel surface during the hot rolling operation. Cold rolling reduces the thickness of the sheets. Following cold reduction, a portion of the product is directed to one of the following lines:

- 72-inch Galvanize Line (No.2 Galvanizing Line); or
- No. 3 Galvanize Line.

In addition, another portion of the product will be further processed prior to electroplating on one of the following lines:

- Electrolytic Tinning Line; or
- Chrome Line (also known as Tin Free Steel – TFS).

The 72-inch and No. 3 Galvanizing Lines apply a coating of zinc to pre-heated steel strip by passing the strip through a pot of molten zinc. The No.3 Galvanizing Line has a pot of aluminum-zinc for galvaluming. The Electrolytic Tinning line applies tin to steel strip using methane sulfonic acid.

Tin plated and galvanized strips can also be passed through chemical treatment baths on their respective lines to apply a thin coating of chrome. In addition, the No. 3 Line has the capability to apply an acrylic coating. Similarly, the 72" line has the capability to apply a zinc–phosphate coating. Wastes from the acrylic and zinc phosphate operations are sent offsite for treatment and disposal (see Figure B-2).

Steel strip is electroplated with chrome in the Chrome Line (TFS). The strip is passed through five vertical electroplating tanks where chrome is applied to the strip on both sides.

Acid cleaning of steel with sulfuric acid is performed at the Electrolytic Tinning Line and the Chrome Line (TFS). Caustic cleaning is performed at each of the four lines discussed above. In addition, caustic cleaning is performed on the Electrolytic Cleaning Line and the Continuous Anneal Line.

2.2 Identification/EPA Classification and Quantities of Hazardous Wastes Generated

Hazardous wastes generated at the Midwest Plant are summarized in Table B-1a of this Permit. The F006 waste code is the only hazardous waste that may be disposed in the Greenbelt II Landfill, the other hazardous wastes produced at the facility are disposed off-site. The F006 hazardous wastes generated at the Midwest Plant are classified as nonwastewaters.

The routing of waste streams is shown schematically in Figure B-2 of the Permit. The various chromium-bearing wastewaters are routed to the Chrome Treatment Plant. Dilute chrome-bearing wastes are reduced from hexavalent to trivalent at the Chrome Treatment Plant. Then the Chrome Treatment Plant employs chemical precipitation to remove metals from the wastewater. Precipitate generated by the chemical precipitation process is pumped to a mechanical dewatering system to be pressed into a filter cake. The filter cake is collected, then transported to the Greenbelt II Landfill or transported off-site for appropriate management.

2.3 Description of Hazardous Waste Management Units

The waste streams shown in Figure B-2 of the Permit are accumulated onsite for up to 90 days or treated at the facility's NPDES-permitted wastewater treatment system. The F006 material may be disposed of in the Greenbelt II Landfill, which is a regulated Hazardous Waste Management Unit subject to Part B permitting. This material may also be managed at an off-site disposal facility.

2.3.1 Waste Management and Handling Procedures

Wastes to be placed in the Greenbelt II Landfill may include wastes from the following general categories:

1. Hazardous Waste;
2. Nonhazardous Waste; or
3. SWMU Remediation Wastes.

Hazardous wastes include wastewater treatment sludge (EPA Hazardous Waste No. F006) from the Chrome Treatment Plant that has been dewatered and possibly F006 contaminated soils and debris. Various chromium-bearing wastewaters are routed to the Chrome Treatment Plant, then reduced from hexavalent chromium to trivalent chromium (chrome reduction). Then the Chrome Treatment Plant employs chemical precipitation to remove metals from the wastewater. Precipitate generated by the chemical precipitation process is pumped to a mechanical dewatering system to be pressed into a filter cake. The filter cake is subsequently collected and transported to either the Greenbelt II Landfill for disposal or transported off-site for appropriate management. The frequency of loads varies, depending on plant production and maintenance schedules. Each truckload represents approximately 15 cubic yards of waste.

Transportation of waste to the Greenbelt II Landfill is provided by the Transportation Department. No manifests are required for the loads because the tractor does not travel on public roads. Once inside the landfill, the tractor-trailer deposits the load in a side by side linear fashion in accordance with provisions of the Landfill System Plan included in Attachment D.

Nonhazardous wastes that may also be disposed in the Greenbelt II Landfill include wastes listed on Table B-1b in Attachment B of the Permit.

Possible hazardous and nonhazardous wastes encountered at Solid Waste Management Units (SWMUs) may be disposed in the Greenbelt II Landfill, if the results of the RFI require soil excavation and disposal.

3.0 SELECTING WASTE ANALYSIS PARAMETERS

This section of the Waste Analysis Plan addresses the following areas:

1. Criteria and rationale for parameter selection; and
2. Special parameter selection requirements.

Additional information concerning selection of waste analysis parameters is provided in Section 1.0 of the WAP QAPP provided as Exhibit A.

3.1 Criteria and Rationale for Parameter Selection

To facilitate waste identification and parameter selection, 40 CFR 261, Appendix VII, Basis for Listing Hazardous Wastes has been reviewed for the hazardous waste to be disposed in the Greenbelt II Landfill (i.e., F006). The applicable regulations were used in conjunction with the chemical analyses of the wastes performed by an independent laboratory to characterize the permittee's wastes and the parameters present in the waste to ensure proper waste management. This WAP also discusses the associated rationale for the waste analysis discussed in this Plan.

Cadmium, chromium (total), lead, nickel, silver, and cyanide (total and amenable) have been selected as constituents of concern because they are the F006 LDR constituents and can reasonably be expected to be found in the filter cake. As detailed below, the permittee has also performed laboratory analysis to evaluate the F006 wastes for toxicity, ignitability, reactivity, and corrosivity to support its current parameter selection discussed above.

Based on the efficiency of the existing mechanical dewatering equipment, regular testing for free liquids using the Paint Filter Test is no longer performed.

3.1.1 Characteristic of Toxicity

Toxicity Characteristic Leaching Procedure (TCLP) results from the monthly analysis of the F006 waste from June 2021 to July 2023 are provided in Appendix C-1 and summarized in Table C-1 of Attachment C of the RCRA Part B Permit.

3.1.2 Characteristic of Ignitability

Liquid and solid samples were previously evaluated for ignitability. None of the samples exhibited the characteristics outlined in 40 CFR 261.21 and 329 IAC 3.1-6-1, "Characteristic of Ignitability".

3.1.3 Characteristic of Reactivity

EPA established an interim criterion that wastes releasing more than 250 milligrams (mg) hydrogen cyanide (HCN) per kilogram (kg) of waste be considered hazardous wastes on the basis of reactivity as defined in 40 CFR 261.23 and 329 IAC 3.1-6-1 [see memorandum from Eileen Claussen dated July 12, 1985 - Interim Thresholds for Toxic Gas Generation: Reactivity]. Cyanide concentrations observed in the F006 sludge during the period from 2021-2023 ranged from 0.013 mg/kg to 9.8 mg/kg. Although the cyanide contained in the filter cake exists as a highly stable potassium ferrocyanide complex, conservatively it was assumed that all cyanide in the waste would evolve to HCN. Consequently, the maximum HCN yield based on the filter cake data from 2021-2023 would be 9.8 mg/kg. This is well below the value of 250 mg HCN/kg waste cited in the above memo. Thus, the F006 sludge contains cyanides at concentrations insufficient to result in classification of the waste as reactive.

3.1.4 Corrosivity

The F006 waste does not exhibit the characteristic of corrosivity as outlined in 40 CFR 261.22 and 329 IAC 3.1-6-1. The pH is generally not less than 2.0 or greater than 12.5, and it does not corrode steel at a rate greater than 6.35 mm per year at 55 degrees C.

3.2 Special Parameter Selection Requirements

The permittee does not have specialized waste management regulatory requirements for the Greenbelt II Landfill. Therefore, this section is not applicable.

4.0 SELECTION OF SAMPLING PROCEDURES

This section of the Waste Analysis Plan addresses the following areas:

1. Sampling strategies and equipment;
2. Sample preservation and storage;
3. Sampling QA/QC procedures; and
4. Health and safety protocols.

Additional detail concerning sampling procedures is provided in Section 4.0 of the WAP QAPP provided as Exhibit A.

4.1 Sampling Strategies and Equipment

When F006 filter cake is regularly being transported to the Greenbelt II Landfill for disposal, a minimum of one sample will be analyzed monthly from the Chrome Treatment Plant filter press to demonstrate compliance with the Best Demonstrated Available Technology (BDAT) LDR treatment standards of 40 CFR Part 268 and 329 IAC 3.1-12-1 and 3.1-12-2. A composite sample will be taken. The composite consists of three simple random grab samples of approximately 200 grams each taken from equally spaced plates within the filter press, including one from near the middle and one from each end.

After it has been demonstrated that the F006 sludge complies with the BDAT LDR treatment standards, the filter cake is solidified further at the Greenbelt II Landfill. Solidification is performed to increase the strength properties for compaction and stability. This is considered a physical process and not a chemical (i.e., treatment) process. Treatment is not needed at the Greenbelt II Landfill because the filter cake transported to the landfill has been previously tested and found to be in compliance with the BDAT LDR treatment standards and it also passes the paint filter test.

Due to the homogeneous nature of the filter press cake, random grab sampling is adequate to provide a representative sample. No stratification has been exhibited in the filter cake. Duplicate samples are obtained at the same time. The duplicate will normally not be analyzed unless the original sample is misplaced or the analyses are not consistent with typical results. A duplicate sample may be periodically analyzed to evaluate the consistency of the sampling procedures. In the event that analytical results exceed the LDR treatment standards, then a

second sample of F006 filter cake may be collected prior to the end of the month in accordance with the above procedures and analyzed for the parameters specified in the WAP QAPP. If the results indicate that the LDR standards are exceeded, the material will not be disposed in the Greenbelt II Landfill and will be shipped off-site for appropriate management. A second sample does not need to be collected if the permittee ships the filter cake off-site for appropriate management.

When regular disposal at the Greenbelt II Landfill is taking place, the Permittee will sample its F006 sludge monthly for TCLP and cyanide chemical analyses.

For additional information concerning the sampling procedures, see Section 4.4 in the WAP Quality Assurance Project Plan presented as Exhibit A to this WAP.

4.2 Sample Containers and Storage

Samples will be collected in the appropriate containers (see Section 4.4.2.1 of the laboratory WAP Quality Assurance Project Plan in Exhibit A for a list of sample containers that will be used). Samples will be sealed in their representative container and cooled to approximately 4°C prior to shipment.

Information concerning sample shipment and storage is presented in Section 4.8 in the WAP Quality Assurance Project Plan (see Exhibit A to this WAP).

4.3 Sampling QA/QC Procedures

Sampling QA/QC procedures are presented in Section 4.7 of the WAP Quality Assurance Project Plan found in Exhibit A.

4.4 Health and Safety Protocols

Field sampling will be performed under the supervision of the Team Leader, which will be the Environmental Control Officer or his duly appointed representative. Sampling personnel will be properly trained in safety and handling techniques.

5.0 LABORATORY TESTING AND ANALYTICAL METHODS

This section of the Waste Analysis Plan addresses the following areas:

1. Selection of an analytical laboratory; and
2. Selection of testing and analytical methods.

5.1 Selection of a Laboratory

The permittee currently utilizes ALS Environmental (ALS) to perform the quantitative chemical analyses specified in the WAP. ALS will continue to follow the comprehensive QA/QC program specified in Exhibit A to the WAP (Quality Assurance Project Plan). In the future, the permittee may utilize another analytical laboratory to comply with the requirements of the WAP, so long as the other laboratory complies with the requirements of the Quality Assurance Project Plan in Exhibit A.

5.2 Selection of Testing and Analytical Methods

The selection of analytical testing methods for the F006 waste stream was based on the following four considerations:

1. Physical state of the waste;
2. Analytes of interest;
3. Required reporting limits; and
4. Compliance with LDR treatment standards.

Collectively, these factors contributed to the selection of analytical procedures designated in Section 7.0 of the laboratory WAP Quality Assurance Project Plan included as Exhibit A. In the event that the permittee becomes subject to new regulatory requirements, additional testing methodologies will be incorporated into the laboratory WAP Quality Assurance Project Plan.

6.0 SELECTION OF WASTE RE-EVALUATION FREQUENCIES

If the monthly TCLP analysis of the F006 sludge indicates that the characteristics of the filter cake have significantly changed for multiple parameters, the filter cake effluent from the Chrome Treatment Plant will be reanalyzed to obtain updated data describing its physical and chemical characteristics. Due to consistency of operations within the mill and lack of change in raw material, this protocol for waste characterization is considered representative. Previous analytical results for the F006 sludge are included in Appendix C-1 of the RCRA Part B Permit. Should process operations change in the mill, the waste will be recharacterized at that time.

If required, the samples will be taken from the storage tank located at the Chrome Treatment Plant. Sampling procedures are presented in Section 4.0 of the WAP Quality Assurance Project Plan (see Exhibit A). A random grab sample will be obtained from the filter cake in the tank by using a dipper attached to a pole. Due to the homogeneous nature of the filter cake, there is no stratification. Thus sampling of various layers is not required. A duplicate sample will be obtained concurrently. However, the duplicate sample will not be analyzed unless the original sample is misplaced or the analysis is inconsistent with previous results.

7.0 SPECIAL PROCEDURAL REQUIREMENTS

7.1 Procedures for Receiving Wastes From Off-Site Generators

The Midwest Plant does not receive hazardous waste from off-site generators. Therefore, this section is not applicable.

7.2 Procedures for Ignitable, Reactive and Incompatible Wastes

The Midwest Plant does not generate hazardous waste that is ignitable, reactive or incompatible.

7.3 Procedures to Ensure Compliance with LDR Requirements

The Midwest Plant is required to implement the sampling and analysis of the F006 sludge disposed in the Greenbelt II Landfill. Procedures presented in this WAP and the WAP Quality Assurance Project Plan appended as Exhibit A will serve to document the procedures for obtaining representative samples of F006 sludge prior to disposal in the Greenbelt II Landfill. Analytical protocol to be employed during laboratory analysis of these samples is presented in the WAP Quality Assurance Project Plan in Exhibit A. When the filter cake is disposed at the Greenbelt II Landfill, the analytical results from the monthly sampling program will be used to evaluate whether the LDR treatment standards have been attained. The current (as of October 2023) LDR treatment standards for the F006 constituents are presented in Table C-3 in the RCRA Part B Permit. Note that the F006 LDR standards for metals are based on the analytical results from the TCLP extract (i.e., mg/L units), while the standards for total and amenable cyanide are based on total constituent concentrations (i.e., mg/kg units).

WASTE ANALYSIS PLAN (WAP)

APPENDIX C-2

EXHIBIT A

QUALITY ASSURANCE PROJECT PLAN

WASTE ANALYSIS PLAN
EXHIBIT A
QUALITY ASSURANCE PROJECT PLAN
UNITED STATES STEEL CORPORATION – MIDWEST PLANT

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1.0 PROJECT DESCRIPTION

This Quality Assurance Project Plan (QAPP) has been formulated to outline the sampling and analysis procedures to be implemented by United States Steel Corporation Midwest Plant – (Midwest Plant) to comply with applicable Federal and State requirements pertaining to operation of the Greenbelt II Landfill.

F006 waste (wastewater treatment sludges from electroplating) is produced from various electroplating lines within the Midwest Plant**.** Figure B-2 of the Permit illustrates the various process lines in use at the Midwest Plant. The permittee will sample its F006 filter cake monthly for chemical analyses when the F006 filter cake is regularly disposed in the Greenbelt II Landfill. This sampling/analysis will not be needed when the F006 filter cake is not disposed in the Greenbelt II Landfill. However, the permittee will need to satisfy the waste characterization requirements of the off-site disposal facility, if the filter cake is disposed off-site instead of within the Greenbelt II Landfill.

Sampling of the filter cake will take place at the Chrome Treatment Plant as the cake falls directly off the dewatering press and prior to deposition at the Greenbelt II Landfill.

Analysis of the filter cake will consist of the following parameters based on the Treatment Standards for Hazardous Wastes 40 CFR 268.40(j).

Parameter	**SW-846 Analytical Method***	**Concentration Limit****
Cadmium, TCLP	6010B / 6020	0.11 mg/l
Chromium (Total),TCLP	6010B / 6020	0.60 mg/l
Nickel, TCLP	6010B / 6020	11.0 mg/l
Lead, TCLP	6010B / 6020	0.75 mg/l
Silver, TCLP	6010B / 6020	0.14 mg/l
Cyanide (Total)	9012	590 mg/kg
Cyanide (Amenable)	9012	30 mg/kg

*Test Methods for Evaluating Solid Waste – Physical/Chemical Methods" (SW-846. Third Edition or currently recognized analytical method update).
** As required by 40 CFR 268.40

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

Various personnel are involved in the characterization of the F006 waste and implementation of this QAPP. They are as follows:

2.1 Environmental Manager

The Environmental Manager (EM) is the primary person responsible for activities at the facility that deals with hazardous waste. The EM and staff coordinate waste sampling, characterization, analyses, treatment, and disposal operations. The EM is also responsible for analytical reports and their contents. Other personnel that deal with the measures and procedures outlined in this QAPP are under the authority of the EM.

2.2 Utilities Manager

The Utilities Manager directs day to day operations of the Chrome Treatment Plant. Through consultation with the Environmental Manager, the Utilities Manager is responsible for the operation and maintenance of waste handling equipment and facilities.

2.3 Utilities Operators

Operators of the Chrome Treatment Plant and Greenbelt II Landfill are responsible for specific tasks as directed by the Utilities Manager. These tasks may include obtaining filter cake samples for analytical testing.

2.4 Laboratory

The current (as of October 2023) laboratory selected by the permittee to implement this QAPP is ALS Environmental of Holland, Michigan (ALS). Although the laboratory standard operating procedures (SOPs) included/referenced in this QAPP are from ALS, another laboratory could implement this QAPP, at the discretion of the permittee. Other laboratories implementing this QAPP must follow the technical procedures presented herein.

2.4.1 Lab Manager

The Lab Manager oversees operations of the laboratory organization.

2.4.2 Project Manager

The Project Manager coordinates aspects of the project with the permittee and laboratory personnel.

2.4.3 Laboratory Supervisors

The Laboratory Supervisor controls production and procedures utilized by the laboratory.

2.4.4 Quality Assurance Manager

The Quality Assurance Manager reviews data, maintains quality control data, and verifies laboratory quality assurance practices.

2.4.5 Sample Custodian

The Sample Custodian signs in samples and determines that Chain of Custody (COC) forms are properly filled out. The Sample Custodian verifies the integrity of the samples and containers upon receipt and maintains sample storage.

3.0 QUALITY ASSURANCE OBJECTIVES

3.1 General

This section contains the reasoning and approach to quality control procedures. It is based upon procedures developed by the USEPA. The overall objective is to develop and implement procedures for the field sampling, chain-of custody, laboratory analysis and reporting that will provide data of known quality that are legally defensible.

Specific procedures to be used for sampling, quality control, audits, preventative maintenance, corrective actions, etc. are described in this QAPP and the associated attachments. The purpose of this section is to define Quality Control (QC) goals for accuracy, precision and completeness. Establishment of these goals allows us to judge the adequacy of results being obtained and take corrective action, if necessary.

3.2 Quality Assurance

Quality Assurance (QA) is defined as procedures that are necessary in order to produce reliable results in sampling and analysis. In general, this refers to uniform field technique, good laboratory practices and good standard operating procedures that are used to maintain consistency of the above. If a deviation from protocol or standard operating procedures occurs, this will be documented on the laboratory report cover sheet. This is also needed to maintain integrity of data.

3.2.1 Quality Control

Quality Control: (QC) utilizes statistical procedures to evaluate and maintain the accuracy of results by controlling the system of analytical measurements.

3.2.2 Accuracy

Accuracy means the closeness of a value to a reference value. For our purpose, spikes and preparation standards will be used as a tool to monitor accuracy in the laboratory. See Table 3.1 for acceptance limits. The applicable limits, definitions and calculations are defined in the laboratory Quality Assurance Manual (QAM) presented as Appendix A of Appendix E-6 to the Permit.

3.2.3 Precision

Precision is defined as the degree of mutual agreement of independent measurements as the result of repeated application of the process under specified conditions. Precision is concerned with the comparability of results from duplicate or replicate analyses (%RPD between the recoveries of two known analyte spikes and %RSD between three or more measurements). The applicable limits, definitions and calculations are defined in the laboratory QAM presented as Appendix A of Appendix E-6 to the Permit.

TABLE 3.1
Accuracy and Precision
Matrix Spike / Matrix Spike Duplicate Control Limits

Parameter	% Recovery		Spike	Duplicate
	Low Limit	High Limit	% RPD	% RPD
Total Metals	75	125	20	20
TCLP Metals	50	150	20	20
Mercury	75	125	20	20
Cyanide	75	125	20	20
Wet Chemistries	80	120	20	20

3.2.4 Completeness

All samples received are analyzed, unless otherwise specified by the permittee. We expect to analyze all samples within QA/QC criteria; however, there will be times when certain QA/QC standards cannot be met.

3.2.5 Comparability

Laboratory comparability reflects the consistency of analyzed results to historical data, and between replicate samples. The laboratory will utilize currently established methods set forth in the USEPA 600/4-79-020 or SW-846, 3rd Edition documents. The use of these methods provides consistent comparable results. As necessary, the laboratory will incorporate the use of revised/updated methods, when approved by the USEPA.

3.2.6 Representativeness

Laboratory representativeness is based on the degree to which sample results represent samples received. The selected laboratory will evaluate representativeness through adherence to the specific analytical procedures, and the quality control requirements in this QAPP.

4.0 SAMPLING PLAN

4.1 General

This section of this QAPP addresses the development and implementation of a scientifically valid sampling plan for the listed F006 waste generated at the Midwest Plant and the documentation for the sampling plan. This sampling plan is designed to be responsive to both regulatory threshold values outlined by the USEPA for the land disposal of F006 sludge (BDAT). The scientific objectives of this plan are to document the sample accuracy and precision.

Sample accuracy is the ability to obtain a representative sample with respect to the waste generated. Sampling precision is the ability to employ a sampling technique for each sample that produces a set of representative samples. Only if the sampling precision and accuracy requirements are met can the samples be considered reliable estimates of the chemical properties of the waste.

4.2 Waste Types

The hazardous waste to be sampled at the Midwest Plant include: Wastewater Treatment Sludge (EPA Hazardous Waste No. F006) from the Chrome Treatment Plant.

4.2.1 SWMU Wastes

Depending upon the outcome of the RCRA Facility Investigation (RFI), the permittee may dispose of wastes from other SWMUs located on the permittee's property within the Greenbelt II Landfill.

4.3 Sampling Frequency

4.3.1 BDAT Chemical Requirements

The degree of sampling accuracy and precision required to reliably estimate the characteristics of the waste is usually outlined in the applicable regulations and performed through statistical analysis. In the case of F006 sludge, and the subsequent BDAT stabilization technology, a maximum allowable concentration is given. Several factors illustrate the uniformity of the permittee's F006 sludge. These are:

1. To produce continuously high-quality steel products, processes are continuously monitored. A large quantity of internal resources are devoted to verifying that the

processes are continuous and uniform. Therefore, the resulting wastes from this process have been shown to be uniform in the past.

Consistency of the chemical nature of the F006 sludge generated is also buffered by the fact that the wastewater which enters the dewatering facility to become F006 sludge has already been through the Chrome Treatment Plant, where the following treatment was performed: metal recovery operations, flocculation, and pH adjustment.

The consistency, and hence accuracy and precision, of the F006 sludge generated at the Midwest Plant is also exhibited by past testing.

As explained in SW-846, sampling frequency is dependent on the sampling accuracy, precision and the amount of information known about the waste generation. Since the influent into the Chrome Treatment Plant is uniform and has been thoroughly analyzed for hazardous constituents in the past, a monthly sampling frequency will provide representative results to illustrate compliance with BDAT regulations.

When F006 is being disposed in the Greenbelt II Landfill, a minimum of one sample will be analyzed monthly from the filter press at the Chrome Treatment Plant to demonstrate compliance with the Best Demonstrated Available Technology (BDAT) LDR treatment standards of 40 C.F.R. Part 268 and 329 I.A.C. §§ 3.1-12-1 and 3.1-12-2. After it has been demonstrated that the F006 sludge complies with the BDAT LDR treatment standards, the filter cake is solidified further at the Greenbelt II Landfill. Solidification is performed to increase the physical strength properties for compaction and stability. This is considered a physical process and not a chemical (i.e., treatment) process. Treatment is not needed at the Greenbelt II Landfill because the filter cake transported to the landfill has been previously tested and found to be in compliance with the BDAT LDR treatment standards and it also passes the paint filter test.

When required, on a monthly basis, a composite sample is collected from the press at the Chrome Treatment Plant. The composite consists of three simple random grab samples of approximately 200 grams each taken from equally spaced plates within the filter press, including one from near the middle and one from each end.

There is little variability in filter cake consistency. According to the press manufacturer, if variability would be exhibited, it would be greatest from the ends to the middle of the press. This maximum possible variability is the rationale for choosing the grab sample locations.

A field duplicate sample will be obtained at the same time. The field duplicate will not be analyzed unless the original sample is damaged or the analysis is not consistent with previous results. The field duplicate may be periodically analyzed as a QA/QC check for sampling and analytical procedures.

4.3.2 Treatment Plant Influent

If the monthly TCLP analysis of the F006 sludge indicates that the characteristics of the filter cake have significantly changed, the filter cake influent from the treatment plant will be analyzed to obtain updated data describing its physical and chemical characteristics. Due to operations consistency within the mill and lack of change in raw material, this protocol for waste characterization is considered representative. Should process operations change in the mill, the waste will be re-characterized at that time. A random grab sample will be obtained from the filter cake tank at the chrome treatment plant. Due to the homogeneous nature of the filter cake stored in the tank, there is no stratification. Thus, sampling of various layers is not required. A field duplicate sample will be obtained at the same time. However, the field duplicate sample will not be analyzed unless the original sample is damaged or the analysis is inconsistent with previous results.

4.4 Sampling Procedures

4.4.1 General

This manual is intended for use by the field sampling team in preparing for and executing the hazardous waste sampling program prior to waste disposal. These procedures address the three major phases in the conduct of a field-monitoring program: pre-field or office activities, on-site sampling activities and post-sampling activities. Each of these phases is addressed herein, first by briefly describing the general tasks that must be considered; then procedures to be followed in implementing each phase.

4.4.2 Pre-Field Office Activities

The first step toward proper quality control is thorough preparation and pre-planning to reduce scheduling conflicts, uncertainty within the sampling protocol, equipment problems, and time spent during field sampling activities.

Preparation for sampling will involve three elements. First, sampling activities will be closely coordinated (techniques and schedule) with plant and analytical laboratory personnel so that the project activities proceed without uncertainty and delay, which can contribute, to the loss of

sample integrity. Secondly, necessary equipment and forms will be assembled. Lastly, sampling personnel will be trained on the operation of sampling equipment, precautions to avoid sample and bottle contamination, and record keeping procedures.

The Project Manager will notify the analytical laboratory about the scheduled sampling at least two (2) days before departure and arrange for the pick-up (or delivery) of the appropriate type and number of sample containers and shipping containers. Necessary equipment will be assembled. The field sampling equipment will be examined to verify that it is in operating condition. Field notes from previous sampling trips will be reviewed so that prior equipment problem notations are not overlooked and so necessary repairs to equipment have been carried out.

A bound, consecutively paginated field logbook will be used to record field data measurements and observations. This logbook will serve as the record of events occurring during the sampling trip. Information recorded at each sampling will at minimum, contain the following details:

a. Sampling date and time;
b. Sampling location and identification number;
c. Name of field crew present at the site;
d. Sampling remarks/observations; and
e. Collection of quality assurance/control samples, if applicable (split or duplicate samples).

The chain-of-custody form documents provide specific details concerning numbers and types of bottles obtained for each sample; preservation details; scheduling and personnel involved; and custody details. The original of this form will accompany the samples from sample collection through analysis. When the laboratory completes the analyses, the laboratory will return to the permittee copies of the chain, along with the final analytical report for inclusion into the project files. Also included as attachments to the custody form are freight bills, post office receipts and bills of lading obtained for shipping samples, if samples are shipped and not delivered to or pick up by the laboratory.

The arrangement of sampling, sample container pick-up or delivery with the laboratory will be made through the Laboratory Project Manager such that sufficient time to correct errors or request additional containers can be made prior to sampling trip departure. The laboratory will verify proper sample bottles and equipment, as well as coordinate the sampling event.

To avoid unnecessary delays in the field and serve as a check on the completeness of sample containers, bottles will be pre-labeled to the extent possible in the office. Sample bottles labeling will be accomplished using pre-printed adhesive labels. The information provided on the label will be the permittee's name and a sample number. Labels will be taped over after marking prior to the sampling trip with clear tape to prevent the label from peeling off due to contact with water and ice in coolers.

4.4.2.1 Sample Containers

Glass sample containers with Teflon lined closures will be used. Due to the matrix and chemistries required, the use of chemical preservatives is not required. Samples will be placed on ice prior to being transported to the laboratory.

4.4.2.2 Sample Labels

Sample Labels are used on sample containers used for sampling:

(NAME OF ANALYTICAL LABORATORY) (Address of Analytical Laboratory) (Phone Number of Analytical Laboratory) _____
SAMPLE I.D. _____ DATE: TIME: COLLECTED BY: _____ SAMPLING SITE: _____ SAMPLE TYPE: □Grab □ Composite □ Other_____

***specific style subject to change.**

4.4.3 On-Site Activities

Two types of sampling will be performed at the times specified in Section 4.3 of this Sampling Plan. Stabilized filter cake from the dewatering press will be obtained under the supervision of the sampling team leader, or appropriately trained individual.

Approximately 200 grams of filter cake from each of the three sections of the presses described in Section 4.3 will be obtained and placed in a stainless steel pan. Once the three samples have been collected, composting of the sample will take place within the pan utilizing a stainless steel spoon or similar hand tool. Approximately 600 grams will be obtained for each sample.

The resultant sample will then be placed into the appropriately labeled jar and immediately sealed. The duplicate sample will be obtained simultaneously by alternately placing spoonfuls of the composited cake into the sample and duplicate sample bottles. Chain-of-custody forms will be filled out for the composite and duplicated samples and accompany the samples to the laboratory.

4.4.4 Post Sampling Activities

Post-sampling activities center on delivering samples to the analytical laboratory for analysis and filing the necessary documentation of the sampling trip. In addition, sampling equipment will be properly stored and required maintenance and/or repairs performed. Once the samples have been collected, the Team Leader will arrange for the delivery to the laboratory and check that the proper chain of custody is documented. The sampling team will return with the samples on ice in a cooler accompanied by the chain of custody. Laboratory personnel will open the coolers and record on the custody records that the seals are still intact. The person making the delivery to the laboratory will note date and time of custody transfer on the chain of custody. The original copy of the custody form will remain with the samples until completion of the analysis.

Upon completing the fieldwork, the Team Leader must verify that necessary work is properly filed. In addition to filing the field logbook, a carbon copy of the chain of custody record and way bills or other transfer documents will be placed in the project files.

Sampling gear and other equipment used will then be checked to ascertain its condition after transport from the site. Repairs and maintenance items as specified by the equipment-operating manual will be pursued as soon as possible after return to the office. The Team Leader will prepare a list of items necessary to be addressed before the sampling equipment is used again and also a recommended course of action to be followed in preparing the equipment for the next trip. Particular attention is taken to replenishing expendable supplies and replacing spare parts used during the trip. The Team Leader will be responsible for overseeing equipment repair and replacement activities.

Sampling equipment will be decontaminated following sampling. Decontamination procedure is presented in Section 4.6.

4.5 Sample Personnel and Training

4.5.1 General

Sampling will be performed at the direction of the Environmental Manager.

4.5.2 Training

Members of the sampling team are trained through on-the-job training, in house training, safety programs and RCRA/OSHA Hazardous Waste Training Program. Re-training is conducted to allow review of the initial training and to update employees on new equipment, sampling procedures and regulatory requirements. An outline of the training program is as follows:

A. Specific Job Responsibilities and Safety
    1. Safe Job Procedures
    2. Personnel Protective Equipment
    3. Safety Regulations
    4. Hazardous Materials
    5. Sampling Procedures
B. Safety and Emergency Procedures
    1. Use and Selection of Fire Extinguishers
    2. Use and Limitations of Self—Contained Breathing Apparatus

4.6 Sampling Equipment Decontamination

Sampling equipment will be decontaminated prior to and following sampling. The equipment will be first rinsed with tap water to remove residual waste. Next, the equipment will be washed with liquid detergent. Finally, the equipment will be triple rinsed with deionized water to verify thorough decontamination.

4.7 Sampling QA/QC

The purpose of the sampling QA/QC is to verify the representativeness of the samples and is performed through the use of field duplicate samples and data validation. When field duplicate samples are sent to the laboratory for analysis, they will not be identified as such to conceal their existence from the laboratory personnel. Method audits and data validation are performed as directed in the QAM contained in Appendix A of Appendix E-6 to the Permit. Because the analyses to be performed are inorganic parameters, the use of trip and field blanks are not necessary.

4.8 Sample Shipment and Storage

Samples will be stored on ice in a cooler or darkened refrigerator prior to transport to the laboratory. Maximum sample holding time must not be greater than that specified by current EPA requirements for analytical holding times. The samples are transported directly to the laboratory by the sampling personnel. The person making the delivery to the laboratory will note date and time of custody transfer on the chain of custody. The original copy of the custody form and sample analyses request form will remain with the samples until completion of analyses.

To verify that the filter cake analyzed by the laboratory is representative of field conditions, the laboratory shall hold the sample for a period of not less than 7 days prior to initiating the TCLP extraction procedures. As the filter cake is not immediately placed in the landfill, the holding period prior to analysis is more reflective of field conditions.

5.0 SAMPLE CUSTODY

The laboratory will incorporate procedures for sample custody. These guidelines are established to maintain the custody of samples in the laboratory, and the legal validity of results generated.

The following details sample receipt, login, storage, internal sample transfer, storage and disposal. Additional details are presented in Section 11 to the QAM. These procedures are applicable from the point at which the selected laboratory receives the samples.

Sample custody is addressed in three parts: field sample collection, laboratory analysis and final evidence files. Final evidence files, including originals of laboratory reports and purge files, will be maintained under document control in a secure area.

A sample or evidence file is under a person's custody if:

- The item is in actual possession of a person; or
- The item is in the view of the person after being in actual possession of the person; or
- The item was in actual physical possession, but is locked up to prevent tampering: or
- The item is in a designated and identified secure area.

5.1 Field Sampling Operations

Samples will remain in the custody of the field sampling group until the sample containers are filled and field logs and Chain of Custody are completed. Each container utilized during the sampling procedure will be identified with a sample label as indicated in Section 4.4.2.2. Samples will be delivered to the laboratory. If, however the samples must be shipped, each sample cooler will be fitted with a Custody Seal indicating the sampler initials, date, and sample time.

5.2 Transfer of Custody

The field sampling group will relinquish the samples to the laboratory by physically delivering the sample containers on ice to the laboratory. At the laboratory, the Sample Custodian will review the samples and containers, sign and date the Chain of Custody Document to receive the samples.

5.3 Laboratory Custody Procedures (LCP)

This section outlines the procedures utilized in sample custody of samples received. This is to be considered a minimum requirement. The following LCP details sample receipt, log in, storage, internal sample transfer, storage and disposal.

5.3.1 Introduction

The LCP is designed to outline the procedures used to initiate and maintain sample custody for samples received in the laboratory. Procedures must be instituted to verify that proper sample custody has been established upon receipt and that this custody is maintained during the entire analytical process.

5.3.2 Responsibility

The contents of the LCP are the responsibility of the Sample Custodian.

5.3.3 Procedure

When a sample cooler is received, the cooler will be inspected externally to evaluate if obvious leakage has occurred. In addition, it will be checked for potential hazard warnings. The cooler seals will be broken and the chain of custody will be removed. The temperature of a sample will be measured using the laboratory sample receipt temperature procedures.

The entire contents of the cooler will be removed and samples will be placed on the log in counter in COC order. Once all of the sample containers are accounted for, the COC is signed by the Sample Custodian. Bottles will be inspected for problems such as leakage or breakage. Upon completion of inspection, the COC will be checked against the sample bottles received. Discrepancies or inadequate volumes will be communicated to the laboratory project manager. The laboratory project manager will then contact the permittee and document discrepancies on the cooler checklist.

The sample custodian will log in the samples to the LIMS that will assign a unique identification number. The LIMS will generate a unique number based on the year, month, receipt sequence, sample number and sample fraction. Samples received by the laboratory will receive a laboratory identification number based on the described sequence. This number will be placed on a label and affixed to each jar received for a given sample.

Once required reviews and paperwork have been completed, the samples will be placed in the appropriate refrigerator (maintained at <6 deg C).

After analysis, samples will be stored appropriately for a minimum of 30 days after the final report is released. At this point, the samples will be disposed in accordance with the laboratory's standard procedures and policies for each matrix involved.

5.4 Final Evidence Files

The final evidence file will be the central repository for reports of sampling and analysis activities as described in this QAPP. Data associated with the project is assembled by the appropriate supervisor based on the analytical performed. The completed Quality Control Data Package is assembled and reviewed by the Project Manager. Once completed, a copy of the QC package is submitted to the Project Manager for inclusion in the electronic Project File. Electronic documents are forwarded to the Environmental Manager. The file is maintained by the Laboratory Project Manager and stored electronically within the LIMS system. The contents of the file, including relevant records, reports, logs, field notebooks, subcontractor reports, data reviews (if necessary) and copies of the final report and Quality Assurance package are stored in a secured electronic file. The final evidence file will be stored for a minimum of five years.

6.0 CALIBRATION PROCEDURE AND FREQUENCY

Analytical calibration procedures utilized at the selected laboratory have been developed to meet or exceed the requirements specified in the latest published edition of SW-846. Variance from these procedures will be approved only by management and QC personnel. Detailed information concerning source, acceptance criteria and procedures are documented in the QAM presented in Appendix A of Appendix E-6.

7.0 ANALYTICAL METHODS

The laboratory will follow analytical procedures derived from methods listed in Section 7.1. Listed in Section 7.2 are the analytical methods to be employed for this project as well as the standard reporting limits for the methods.

Analyses conducted in the laboratory are reviewed to verify compliance with the guidelines established in the referenced methods, the laboratories SOP's and this QAPP. No deviation from these procedures will occur without notification to and approval of the Quality Assurance Manager.

The analytical laboratory will have established specific SOPs for the tests to be analyzed for this project. These SOPs reflect the procedures used when analyzing samples in the laboratory. These procedures are maintained by the Quality Assurance Manager and routinely updated when changes are warranted or updated method released. Copies of the following SOPs are found in Appendix A of Appendix E-6 to the Permit:

- Metals By ICP-MS;
- Cyanide By Manual Colorimetric Analysis;
- TCLP Preparation (Metals);
- Low Volume Metals Digestion; and
- Toxicity Characteristic Leaching Procedures – Non-Volatile Extraction.

7.1 Method References

- Methods for Chemical Analysis of Water and Waste, EPA No. 600-79-020, March, 1979 (revised March, 1983);
- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", SW-846, Third Edition, Revised March, 2009 and subsequent updates, supplements or amendments;
- Standard Methods for the Examination of Water and Waste Water, 18th Edition.

7.2 Analytical Methods Summary

Parameter	SW-846 Analytical Method*	Standard Reporting Limits**	
		AQ	SL
Cadmium, TCLP	6010B / 6020	0.01	
Chromium (Total),TCLP	6010B / 6020	0.05	
Nickel, TCLP	6010B / 6020	0.02	
Lead, TCLP	6010B / 6020	0.05	
Silver, TCLP	6010B / 6020	0.01	
Cyanide (Total)	9012	0.005	0.2
Cyanide (Amenable)	9012 or OIA 1677	0.005	0.2

*"Test Methods for Evaluating Solid Waste – Physical/Chemical Methods" latest edition.
**Reporting limits indicated are presented in mg/L (Aqueous – AQ) and mg/Kg (Solid – SL). Actual reporting limits may vary as the result of matrix and quality control data.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

The selected laboratory will utilize specific procedures to verify proper and thorough data reduction, validation and reporting. Detailed descriptions of these QA procedures are found in the laboratory QAM presented as Appendix A of Appendix E-6.

9.0 INTERNAL LABORATORY QUALITY CONTROL

9.1 Quality control procedures

The laboratory has a mature QA system that incorporates a variety of QC types to verify internal laboratory quality control. Method Blanks, Matrix spikes, matrix spike duplicates are commonly used to assess QC performance.

Detailed information concerning the Internal QC program is presented in the laboratory QAM presented as Appendix A of Appendix E-6.

9.1.1 Field Duplicates

Field duplicates may be provided by the sampling entity. These duplicates are analyzed in the same fashion as field samples. Analysis of these duplicates is used to assess analytical precision, and representativeness of field sampling activities.

As indicated in Section 4.3, duplicate samples of the filter cake will be taken to facilitate reanalysis, if required. On a Quarterly basis, this duplicate will be run as a confirmation of the sampling technique and the homogeneity of the waste material.

10.0 INTERNAL LABORATORY PERFORMANCE AND SYSTEM AUDITS

Performance and system audits are the responsibility of Quality Assurance personnel. Performance and system audits are conducted routinely. These audits are designed to assess the quality of the total laboratory operation and to assure adherence to the quality control procedures specified in this QAPP. Details pertaining to the audit systems are presented in the QAM located in Appendix A of Appendix E-6 to the Permit.

11.0 PREVENTATIVE MAINTENANCE

In order to assure high quality analytical results, the selected laboratory has employed specific and detailed schedules of preventative maintenance for the analytical equipment. A summary of instrument maintenance activities is contained in the laboratory QAM located in Appendix A of Appendix E-6 to the Permit.

12.0 SPECIFIC ROUTINE PROCEDUDRES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

Please refer to the QAM for a detailed description of the routine procedures used to assess data precision, accuracy and completeness. The laboratory QAM is located as Appendix A of Appendix E-6 to the Permit.

13.0 LABORATORY CORRECTIVE ACTION

Non-conformance procedures are employed when batch QC are outside established limits. A detailed review of the laboratory's process is located in Section 7 of the laboratory QAM contained in Appendix A of Appendix E-6 to the Permit.

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Section 8.0 establishes the requirement for procedures to be utilized in validation of data generated under this QAPP. Quality assurance personnel will be responsible for compiling data and presenting updates and reports to management. QA reports will follow the process outline contained in the laboratory QAM contained in Appendix A of Appendix E-6.