UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAR - 1 2019

REPLY TO THE ATTENTION OF:
WW-16J

Angela Brown
Chief, Watershed Planning and Restoration Section
Office of Water Quality, Indiana Department of Environmental Management
MC 65-42 Shadeland
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

Dear Ms. Brown:

The U.S. Environmental Protection Agency has reviewed the revised approval (dated October 26, 2017) of the St. Joseph River Watershed (SJRW) Total Maximum Daily Load (TMDL) report and has determined that EPA mistakenly identified bacteria and nutrient TMDLs assigned to subwatersheds 04100003-06-02 and 04100003-06-03 in Tables 1, 4 and 6 of EPA's Decision Document of October 26, 2017. Additionally, EPA has updated the final bacteria TMDL numbers in Section 13 to reflect the change in Tables 1 and 4. EPA has corrected the revised Decision Document of October 26, 2017, and I am enclosing a copy of the updated TMDL Decision Document for your records.

If you have any questions, please contact Mr. David Werbach, TMDL Coordinator, at 312-886-4242.

Sincerely,

Peter Swenson
Chief, Watersheds & Wetlands Branch

TMDL: St. Joseph River Watershed in Allen, DeKalb, Noble and Steuben Counties, Indiana
Date: March 1, 2019 (revised)

DECISION DOCUMENT
FOR THE ST. JOSEPH RIVER WATERSHED TMDL, INDIANA

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody and specify the link between the pollutant of concern and the water quality standard (see Section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

(1) the spatial extent of the watershed in which the impaired waterbody is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and
(5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment

impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

Location Description/Spatial Extent:

The St. Joseph River Watershed (SJRW) is located in south central Michigan, northwestern Ohio and northeastern Indiana (Figure 1 of the final TMDL document) and encompasses approximately 1,085 square miles (mi^2) (694,400 acres) across these three states. The portion of the SJRW in the State of Indiana is approximately 591 mi^2 (378,240 acres) and covers portions of Allen, DeKalb, Noble and Steuben Counties. The St. Joseph River originates in Hillsdale County, Michigan and flows southwest through Ohio and into Indiana before joining the St. Marys River in Fort Wayne, Indiana. Waters from the St. Joseph River and the St. Marys River form the Maumee River, which then flows northeasterly to Lake Erie.

Table 1 of this Decision Document identifies the Hydrologic Unit Code (HUC) ten scale (HUC-10) subwatersheds in the SJRW and the HUC-12 scale watersheds where Indiana has found impaired waters which are addressed by this TMDL. The Indiana Department of Environmental Management (IDEM) monitored the health of the stream environments in the SJRW by collecting field data on the chemical, physical and habitat characteristics (ex. sediment data) of individual stream reaches as well as aquatic biological community data in 2014. IDEM reviewed water quality data for individual waters and made assessment determinations of which individual waterbodies were impaired according to water quality standard (WQS) and water quality target (WQT) values (Table 1 of this Decision Document).

Table 1: Summary of Impairments in the St. Joseph River Watershed and TMDL Count

HUC-12	2016 AUID	303(d) Listed Parameter	Impaired Beneficial Use	TMDL
Fish Creek (04100003-04)				
04100003-04-01	INA0341_01	*E. coli*	Recreational Use	*E. coli*
	INA0341_02	*E. coli*	Recreational Use	*E. coli*
04100003-04-02	INA0342_01	*E. coli*	Recreational Use	*E. coli*
	INA0342_T1003	*E. coli*	Recreational Use	*E. coli*
	INA0342_T1004	*E. coli*	Recreational Use	*E. coli*
04100003-04-04	INA0344_03	*E. coli*	Recreational Use	*E. coli*
04100003-04-05	INA0345_01	*E. coli*	Recreational Use	*E. coli*
	INA0345_01	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0345_01	dissolved oxygen	Aquatic Life Use	nutrient
04100003-04-06	INA0346_01	*E. coli*	Recreational Use	*E. coli*
	INA0346_01	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0346_01	Impaired Biotic Communities (IBC)	Aquatic Life Use	nutrient
	INA0346_T1003	*E. coli*	Recreational Use	*E. coli*
	INA0346_T1003	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0346_T1003	Impaired Biotic Communities (IBC)	Aquatic Life Use	nutrient
Sol Shank Ditch - St. Joseph River (04100003-05)				
04100003-05-02	INA0352_04	*E. coli*	Recreational Use	*E. coli*
	INA0352_05	*E. coli*	Recreational Use	*E. coli*
Mason Ditch - Cedar Creek (04100003-06)				
04100003-06-01	INA0361_01	*E. coli*	Recreational Use	*E. coli*
	INA0361_01A	*E. coli*	Recreational Use	*E. coli*

	INA0361_02	*E. coli*	Recreational Use	*E. coli*
	INA0361_03	*E. coli*	Recreational Use	*E. coli*
	INA0361_03	nutrients	Aquatic Life Use	nutrient
	INA0361_04	*E. coli*	Recreational Use	*E. coli*
	INA0361_04	nutrients	Aquatic Life Use	nutrient
	INA0361_T1001	*E. coli*	Recreational Use	*E. coli*
	INA0361_T1002	*E. coli*	Recreational Use	*E. coli*
04100003-06-02	INA0362_02	*E. coli*	Recreational Use	*E. coli*
	INA0362_02	nutrients	Aquatic Life Use	nutrient
	INA0362_03	*E. coli*	Recreational Use	*E. coli*
	INA0362_03	nutrients	Aquatic Life Use	nutrient
	INA0362_04	*E. coli*	Recreational Use	*E. coli*
	INA0362_04	nutrients	Aquatic Life Use	nutrient
	INA0362_T1004	*E. coli*	Recreational Use	*E. coli*
	INA0363_03	*E. coli*	Recreational Use	*E. coli*
	INA0363_03	nutrients	Aquatic Life Use	nutrient
04100003-06-03	INA0363_T1001	Impaired Biotic Communities (IBC)	Aquatic Life Use	nutrient
04100003-06-04	INA0364_01	*E. coli*	Recreational Use	*E. coli*
	INA0364_02	*E. coli*	Recreational Use	*E. coli*
	INA0364_03	*E. coli*	Recreational Use	*E. coli*
	INA0364_04	*E. coli*	Recreational Use	*E. coli*
	INA0364_05	*E. coli*	Recreational Use	*E. coli*
	INA0364_06	*E. coli*	Recreational Use	*E. coli*
	INA0364_T1001	*E. coli*	Recreational Use	*E. coli*
	INA0364_T1002	*E. coli*	Recreational Use	*E. coli*
Cedar Creek (04100003-07)				
04100003-07-02	INA0372_01	*E. coli*	Recreational Use	*E. coli*
	INA0372_01	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0372_01	dissolved oxygen	Aquatic Life Use	nutrient
	INA0372_02	*E. coli*	Recreational Use	*E. coli*
	INA0372_T1002	*E. coli*	Recreational Use	*E. coli*
	INA0372_T1002A	*E. coli*	Recreational Use	*E. coli*
	INA0372_T1003	*E. coli*	Recreational Use	*E. coli*
04100003-07-04	INA0374_03	*E. coli*	Recreational Use	*E. coli*
	INA0374_04	*E. coli*	Recreational Use	*E. coli*
	INA0374_05	*E. coli*	Recreational Use	*E. coli*
	INA0374_05	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0374_T1008	*E. coli*	Recreational Use	*E. coli*
	INA0374_T1009	*E. coli*	Recreational Use	*E. coli*
	INA0374_T1010	*E. coli*	Recreational Use	*E. coli*
04100003-07-05	INA0375_01	*E. coli*	Recreational Use	*E. coli*
	INA0375_02	*E. coli*	Recreational Use	*E. coli*
	INA0375_03	*E. coli*	Recreational Use	*E. coli*
	INA0375_04	*E. coli*	Recreational Use	*E. coli*
	INA0375_05	*E. coli*	Recreational Use	*E. coli*
	INA0375_05	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0375_06	*E. coli*	Recreational Use	*E. coli*
	INA0375_06	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*

	INA0375_T1007	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
04100003-07-06	INA0376_02	*E. coli*	Recreational Use	*E. coli*
	INA0376_03	*E. coli*	Recreational Use	*E. coli*
	INA0376_T1004	*E. coli*	Recreational Use	*E. coli*
04100003-07-07	INA0377_01	*E. coli*	Recreational Use	*E. coli*
	INA0377_02	*E. coli*	Recreational Use	*E. coli*
	INA0377_03	*E. coli*	Recreational Use	*E. coli*
	INA0377_03	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0377_03	Impaired Biotic Communities (IBC)	Aquatic Life Use	nutrient
	INA0377_04	*E. coli*	Recreational Use	*E. coli*
	INA0377_04	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0377_04	Impaired Biotic Communities (IBC)	Aquatic Life Use	nutrient
	INA0377_T1001	*E. coli*	Recreational Use	*E. coli*
	INA0377_T1002	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0377_T1002	nutrients	Aquatic Life Use	nutrient
St. Joseph River (04100003-08)				
04100003-08-02	INA0382_01	*E. coli*	Recreational Use	*E. coli*
04100003-08-03	INA0383_01	*E. coli*	Recreational Use	*E. coli*
	INA0383_T1003	*E. coli*	Recreational Use	*E. coli*
04100003-08-06	INA0386_01	Impaired Biotic Communities (IBC)	Aquatic Life Use	*TSS (sediment)*
	INA0386_01	Impaired Biotic Communities (IBC)	Aquatic Life Use	nutrient

IDEM explained that segments which are impaired due to depleted dissolved oxygen (DO) in the water column were addressed via nutrient (total phosphorus) TMDLs and those segments which exhibited impaired biology (i.e., impaired biotic communities (IBC)) were addressed via total phosphorus (TP) and total suspended solid (TSS) TMDLs. IDEM linked DO and IBC impairments, observed in the SJRW, to nutrient and sediment inputs and explained that implementation efforts designed to mitigate phosphorus and sediment inputs to surface waters would likely result in improved DO conditions within the water column and improved habitat for fish and macroinvertebrate communities.

Land Use:

The SJRW watershed encompasses approximately 694,400 acres (1,085 square miles) in south central Michigan, northwestern Ohio and northeastern Indiana. Land use in the SJRW is comprised of agricultural lands, pasture/hay lands, forested lands, wetlands, developed lands, grassland and shrub lands and open water. Land use coverages from National Land Cover Dataset (2011) were used to characterize land use in the SJRW (Table 2 of this Decision Document). Cultivated crop lands (52%) and pasture/hay (17%) land uses account for approximately 69% of the land uses in the SJRW. IDEM has recognized that agricultural land uses can be significant sources of *E. coli*, TP and sediment.

Table 2: Land use in the St. Joseph River Watershed

Land Use Category Description	Acreage	Square Miles	Distribution (% of the total area in the St. Joseph River Watershed)
Cultivated crops	361,974.00	565.58	52.13%
Pasture/hay	118,961.00	185.88	17.13%
Deciduous forest	70,270.00	109.80	10.12%
Woody wetlands	48,971.00	76.52	7.05%
Developed - open space	40,810.00	63.77	5.88%
Developed - low intensity	22,621.00	35.35	3.26%

Open Water	8,644.00	13.51	1.24%
Developed - medium intensity	7,712.00	12.05	1.11%
Shrub/scrub	3,751.00	5.86	0.54%
Developed - high intensity	3,066.00	4.79	0.44%
Emergent herbaceous wetlands	2,763.00	4.32	0.40%
Grassland/herbaceous	2,612.00	4.08	0.38%
Evergreen forest	1,365.00	2.13	0.20%
Barren land	548.00	0.86	0.08%
Mixed forest	334.00	0.52	0.05%
TOTAL	**694,402.00**	**1,085.00**	**100%**

Problem Identification:

Bacteria TMDLs: Bacteria exceedances can negatively impact recreational uses (i.e., fishing, swimming, wading, boating, etc.) and public health. At elevated levels, bacteria may cause illness within humans who have contact with or ingest bacteria laden water. Recreation-based contact can lead to ear, nose, and throat infections, and stomach illness. During the analyses of water quality data, the presence of *E. coli* confirms the presence of bacteria in that water quality sample.

Phosphorus TMDLs: While total phosphorus is an essential nutrient for aquatic life, elevated concentrations of TP can lead to nuisance algal blooms that negatively impact aquatic life and recreation (i.e., swimming, boating, fishing, etc.). Algal decomposition depletes dissolved oxygen levels within the water column which can stress benthic macroinvertebrates and fish. Excess algae can shade the water column which limits the distribution of aquatic vegetation. Aquatic vegetation stabilizes bottom sediments, and also is an important habitat for macroinvertebrates and fish. Further, depletion of dissolved oxygen can cause phosphorus release from bottom sediments (i.e., internal loading).

Degradations in aquatic habitats or water quality (e.g., low dissolved oxygen levels in the water column) can negatively impact aquatic life use. Increased turbidity, brought on by elevated levels of nutrients within the water column, can reduce dissolved oxygen in the water column, and cause large shifts in dissolved oxygen and pH throughout the day. Shifting chemical conditions within the water column may stress aquatic biota (fish and macroinvertebrate species). In some instances, degradations in aquatic habitats or water quality have reduced fish populations or altered fish communities from those communities supporting sport fish species to communities which support more tolerant rough fish species.

TSS TMDLs: Excess siltation and flow alteration in streams may impact aquatic life by altering habitats. Excess sediment can fill pools, embed substrates, and reduce connectivity between different stream habitats. The result is a decline in habitat types that in healthy streams support diverse macroinvertebrate communities. Excess sediment can also reduce spawning and rearing habitats for certain fish species. In addition, excess suspended sediment can clog the gills of fish and thus reduce fish health. Flow alterations within the SJRW due to drainage improvements on or near agricultural lands, have in some instances resulted in increased peak flows. Higher peak flows in stream environments, which typically occur during storm events, can carry increased sediment loads to streams and erode streambanks. Deposited fine sediments may embed substrates leading to habitat loss. Similar to the nutrient effects discussed above, this may result in reduced fish populations or altered fish communities from those communities supporting sport fish species to communities which support rough fish species.

Priority Ranking:
The SJRW TMDLs were prioritized to be completed based on local interest in addressing water quality deficiencies within the watershed, IDEM's interest in conducting baseline water quality monitoring for local planning, and the willingness of local partners (e.g., the St. Joseph River Watershed Initiative) to develop Section 319 applications and watershed management plans (WMP). The development and adoption of local WMPs will lead to the implementation of best management practices (BMPs) and other mitigation strategies to improve water quality within the SJRW.

EPA has also prioritized the SJRW TMDL and SJRW implementation efforts because of the location of the St. Joseph River watershed at the headwaters of the Maumee River basin. The Maumee River is one of the largest tributaries to Lake Erie, which since the 1990s has experienced decreased water quality due to excessive algal growth and increased turbidity. Excessive algal growth can lead to toxic (blue-green algae (cyanobacteria)) algal blooms, fluctuations in water column chemistry (i.e., dissolved oxygen and pH), degradations in aquatic habitats and impacted recreational use. Recent work under the U.S.-Canada Great Lakes Water Quality Agreement – Annex 4 has established binational phosphorus load reduction targets for the western basin of Lake Erie, which includes the Maumee River basin. These targets are focused on reducing total particulate phosphorus (TP) and dissolved reactive phosphorus (DRP) contributions from surface waters in the Maumee River basin which eventually drain into Lake Erie.

EPA, together with the Michigan Department of Environmental Quality, the Ohio Environmental Protection Agency and IDEM, is in the process of developing an Annex 4 specific methodology to calculate load and concentration targets needed to meet Annex 4 phosphorus targets for the Maumee River basin, including the SJRW. EPA anticipates that this methodology will enable watershed managers in the SJRW and other watersheds in the Western Lake Erie Basin to evaluate whether TMDL endpoints are meeting, or not meeting, Annex 4 annual and spring loading targets. The SJRW TMDLs developed by the State of Indiana will aid in efforts to reduce loading in the larger Maumee River basin and will provide an understanding of baseline phosphorus loading conditions against which the Annex 4 specific phosphorus loading calculations can be compared. As additional Annex 4 related information becomes available (e.g., the Annex 4 Methodology approach), the SJRW TMDLs may be revised as appropriate.

Pollutants of Concern:
Recreational Use: The pollutant of concern for total body contact recreational use impairment is *E. coli* which is an indicator for pathogenic bacteria.

Aquatic Community Support: 327 IAC 2-1-3(a)(2)(A) states that all surface waters should be capable of supporting a well-balanced, warm water aquatic community. The pollutants of concern for aquatic life use impairment are excess TP (nutrients) and excess TSS (sediment).

Source Identification (point and nonpoint sources):
Point Source Identification: The potential point sources to the SJRW are:

National Pollutant Discharge Elimination System (NPDES) permit holders: NPDES permitted facilities may contribute pollutant loads (e.g., bacteria, TP or sediment) to surface waters through facility discharges of treated wastewater. Permitted facilities discharge wastewater according to their NPDES permit. IDEM identified NPDES permit holders in the Indiana portion of the SJRW which were assigned a portion of the wasteload allocation (WLA) in Table C-3 of Appendix C of the final TMDL document.

Municipal Separate Storm Sewer Systems (MS4): Stormwater from MS4s can transport pollutants (e.g., bacteria, TP and sediment) to surface waterbodies during or shortly after storm events. IDEM identified three MS4 permittees in the Indiana portion of the SJRW, the City of Fort Wayne (INR040029), the City of Auburn (INR040119) and Allen County (INR040131) which were assigned a portion of the WLA (Tables 4, 6 and 7 of this Decision Document).

Stormwater runoff from permitted construction and industrial areas: Construction and industrial sites may contribute nutrients (TP) and sediment to surface waters during stormwater runoff events. For certain subwatershed, the SJRW TP and TSS TMDLs assume that there will be nutrient and sediment stormwater inputs from construction and industrial sites. Therefore, in select subwatersheds, IDEM calculated a WLA to be assigned to construction stormwater and industrial stormwater. Construction and industrial areas in the SJRW must comply with the requirements of IDEM's Stormwater Program.

Combined Sewer Overflows (CSOs): Combined sewers are defined as sewers designed and employed to receive both (1) water-carried or liquid wastes; and, (2) storm or surface water (327 IAC 5-1.5-7). There are three facilities in the Indiana portion of the SJRW which contain CSO outfalls which discharge into waters of the SJRW, the Auburn Wastewater Treatment Plant (WWTP) (IN0020672), the Butler WWTP (IN0022462) and the Fort Wayne WWTP (IN0032191). During periods of heavy rainfall or snowmelt, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. CSOs may discharge bacteria, nutrients and/or sediment into surface waters of the SJRW during or shortly after storm events. IAC Article 15, Industrial Wastewater Pretreatment Programs and NPDES includes regulations specific to communities experiencing CSOs. IDEM explained that the elimination of CSOs in the Fort Wayne area is described in the City of Fort Wayne's Long Term Control Plan (LTCP).

Sanitary Sewer Overflows (SSOs): SSOs may deliver pollutants to waterways during or shortly after storm events. IAC Article 15, Industrial Wastewater Pretreatment Programs and NPDES includes regulations specific to communities experiencing sanitary sewer overflows. IDEM identified one SSO location in the Indiana portion of the SJRW affiliated with the Fort Wayne Municipal WWTP (IN0032191).

Concentrated Animal Feeding Operations (CAFOs): IDEM identified five CAFO facilities in the Indiana portion of the SJRW (Table 11 of the final TMDL document). CAFO facilities must be designed to contain all surface water runoff and are prohibited from discharging to surface waters (Section 4.2.3 of the final TMDL document). Therefore, IDEM did not assigned a portion of the WLA (WLA = 0) to these five CAFO facilities.

Nonpoint Source Identification: The potential nonpoint sources to the SJRW are:

Non-regulated urban runoff: Runoff from urban areas (urban, residential, commercial or industrial land uses) can contribute various pollutants (e.g., bacteria, TP and sediments) to local waterbodies.

Stormwater from urban areas, which drain impervious surfaces, may introduce pollutants to surface waters. Potential urban sources of bacteria and nutrients can also include wildlife or pet wastes.

Confined feeding operations (CFOs): CFOs are agricultural operations where animals are kept and raised in confined spaces. CFOs generate manure which may be spread onto fields. CFOs do not meet the definition of a CAFO and are considered by IDEM as a nonpoint source. CFOs have state-issued permits but are not under the jurisdiction of the federal NPDES Program. CFO permits are "no discharge" permits. Therefore, it is prohibited for these facilities to discharge to any water of the State. IDEM identified CFOs within the Indiana portion of the SJRW (Table C-14 of Appendix C of the final TMDL document).

Stormwater runoff from agricultural land use practices: Runoff from agricultural lands may contain significant amounts of pollutants (e.g., bacteria, TP and sediments) which may lead to impairments in surface waters of the SJRW. Manure and fertilizer spread onto fields is often a source of pollutants, and their export can be exacerbated by tile drainage lines, which channelize the stormwater flows and reduce the time available for bacteria to die-off. Sediment and nutrients can be mobilized in a similar fashion to bacteria. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters.

Stream channelization and stream erosion: Eroding streambanks and channelization efforts may add sediment and TP to local surface waters. TP may be added if there is particulate phosphorus bound with eroding soils. Eroding riparian areas may be linked to soil inputs within the water column and potentially to changes in flow patterns. Changes in flow patterns may also encourage down-cutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed.

Unrestricted livestock access to streams: Livestock with access to stream environments may add bacteria and nutrients (TP) directly to the surfaces waters or resuspend particles that had settled on the stream bottom. Direct deposition of animal wastes can result in very high localized bacteria and nutrient counts and may contribute to downstream impairments. Smaller animal facilities may add bacteria and nutrients to surface waters via wastewater from these facilities or stormwater runoff from near-stream pastures.

Septic systems: Failing septic systems are a potential source of bacteria and nutrients within the SJRW. Septic systems generally do not discharge directly into a waterbody, but their effluents may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. All the counties in the watershed follow the state rules IAC 6-8.3-52 (general sewage disposal requirements) and IAC 6-8.3-55 (violations; permit denial and revocation) regarding septic systems. Failures are typically identified through public complaints and the sale of older properties which have not passed inspection.

Wildlife: Deer, geese, ducks, raccoons, turkeys, and other animals are recognized as potential contributors of bacteria and nutrients to the SJRW.

Future Growth:
IDEM determined that from 2000 to 2010, Allen, DeKalb, Noble and Steuben counties all saw population grow (Section 7.2.5 of the final TMDL document). To account for this population growth, IDEM included an allocation for future growth (AFG) as part of its TMDL calculations (Tables 4, 6 and 7 of this Decision Document). The AFG was set at 5% of the loading capacity for each flow regime. As the population continues to grow in northeastern Indiana, IDEM believes that the AFG will provide additional protection for instream water quality. The WLA and the load allocation (LA) were calculated for all current sources. Any expansion of point or nonpoint sources will need to comply with the respective WLA and LA values in the TMDL.

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of the first criterion.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Targets

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:
Designated Uses:
The designated uses for waterbodies identified in the SJRW TMDL are for total body contact recreation use and aquatic life use.

Recreational use: IDEM explained that *E. coli* is an indicator of the possible presence of pathogenic organisms (e.g., *E. coli*, viruses, and protozoa) which may cause human illness. *E. coli* is a sub-group of fecal coliforms and is used as an indicator of potential fecal contamination. Concentrations are typically reported as the count of organisms in 100 milliliters of water (count/100 mL) and may vary at a particular site depending on the baseline *E. coli* level already in the river, inputs from other sources, dilution due to precipitation events, and die-off or multiplication of the organism within the river water and sediments.[1]

The numeric *E. coli* criteria associated with protecting the recreational use are described below. *"The criteria in this subsection are to be used to evaluate waters for full body contact recreational uses, to establish wastewater treatment requirements, and to establish effluent limits during the recreational season, which is defined as the months of April through October, inclusive. E. coli bacteria, shall not exceed one hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period nor exceed two hundred thirty-five (235) per one hundred (100) milliliters in any one (1) sample in a thirty (30) day period. . . However, a single sample shall be used for making beach notification and closure decisions."* [Source: Indiana Administrative Code Title 327 Water Pollution Control Board. Article 2. Section 1-6(d).]

Waterbodies are held to recreational use criteria during the time of the year when people are most likely to be engaged in activities such as swimming, wading or boating. The recreational use criteria were established to protect against disease carrying organisms that may be ingested or introduced to the eyes, skin or other body parts during water recreation activities.

E. coli TMDL target:

For *E. coli* TMDLs, allocations were calculated based upon the 235 cfu/100 mL portion of the criteria. EPA believes this is protective of both portions of the criteria. An EPA report, "*An Approach for Using Load Duration Curves in the Development of TMDLs*" (EPA 841-B-07-006, August 2007) describes how the monthly geometric mean (in this case, 125 cfu/100 mL for *E. coli*) is likely to be met when the single sample maximum value (in this case, 235 cfu/100 mL for *E. coli*) is used to develop the loading capacity. The process outlined in the 2007 EPA report calculates the daily maximum bacteria value that is possible to observe and still attain the monthly geometric mean. If the single sample maximum is set as a never-to-be surpassed value then it becomes the maximum value that can be observed, and all other bacteria values would have to be less than the maximum (i.e., 235 cfu/100 mL). EPA notes that whichever portion of the criteria is used to determine the allocations for the TMDL, both the monthly geometric mean and single sample maximum will be used to assess the extent of implementation by point and nonpoint sources.

Aquatic Life Use: 327 IAC 2-1-3(a)(2)(A) states that all surface waters, except as described in subdivision (5), will be capable of supporting a well-balanced, warm water aquatic community. Furthermore, at all times, all surface waters outside of mixing zones shall be free of substances in concentrations that on the basis of available scientific data are believed to be sufficient to injure, be chronically toxic to, or be carcinogenic, mutagenic, or teratogenic to humans, animals, aquatic life, or plants (327 IAC 2-1-6(a)(2)).

Phosphorus and TSS TMDL targets:

Currently IDEM has not developed numeric criteria for TP and TSS. For the SJRW TP and TSS TMDLs, IDEM employed water quality targets for TP (**0.30 mg/L**) and TSS (**30.0 mg/L**) as endpoints for TMDL calculations (Table 3 of this Decision Document). Water quality target values were applied to improve water quality within waterbodies related to nutrient and sediment inputs, to improve DO concentrations in the water column and to improve conditions to support well balanced aquatic

[1] Total Maximum Daily Load Report for the St. Joseph River Watershed Indiana TMDLs (August 8, 2017), page 32.

communities. In several tributaries to SJRW, DO and biological communities demonstrated conditions indicating that their respective water quality targets were not being met. Low DO is often the result of elevated nutrient levels (TP), while biological community deficiencies can be generally associated with higher sediment or nutrient concentrations. The basis for the TP and TSS targets are discussed in Section 2 of the final TMDL document.

The State of Indiana strives to achieve waters free from substances that, "contribute to the growth of nuisance plants or algae" within the water column. IDEM believes that exceedances of TP and/or TSS targets impact the overall health of biological communities and levels of DO within the water column. IDEM identified segments with low DO and areas with impaired biological communities during its water quality assessment activities in 2014-2015. IDEM indicated that the DO and IBC impaired areas were thought to be influenced by increased concentrations of TP and or TSS.

Table 3: Water quality standards and targets* utilized within the SJRW TMDLs

Parameter	Units	TMDL Targets
Numeric Water Quality Standards for addressing the Bacteria (*E. coli*) impaired segments within the SJRW		
E. Coli [1]	# cfu / 100 mL	**235 single sample maximum**
		Geometric mean < 125 [2]
Numeric Water Quality Target [3] for addressing the Nutrient impaired segments within the SJRW		
Total Phosphorus (TP)	mg/L	No value should be greater than **0.30 mg/L**
Numeric Water Quality Target [4] for addressing the Sediment impaired segments within the SJRW		
Total Suspended Solids (TSS)	mg/L	No value should be greater than **30.0 mg/L**
Numeric Water Quality criteria and targets for addressing the Dissolved Oxygen and Biotic Community impaired segments within the SJRW		
Dissolved Oxygen (DO)	mg/L	No value should be less than 4.0 mg/L [5]
Fish community Index of Biotic Integrity (IBI)	Score	Fully supporting IBI ≥ 36
Benthic aquatic macroinvertebrate community index (mIBI)	Score	Fully supporting mIBI ≥ 36

* = Section 2 of the final TMDL document
1 = *E. coli* standards are for the recreation season only (April 1 through October 31).
2 = Geometric mean based on minimum of 5 evenly spaced samples taken over not more than a 30-day period.
3 = IDEM anticipates that by meeting the TP target the water quality in the waterbody will be able to support a well-balanced aquatic community.
4 = IDEM anticipates that by meeting the TSS target the water quality in the waterbody will be able to support a well-balanced aquatic community
5 = Indiana Administrative Code Title 327 Water Pollution Control Board. Article 2. Section 1-6(a)

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of the second criterion.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for steam flow, loading, and water quality parameters as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:
IDEM determined the loading capacities for the impaired waterbodies in the SJRW based on the water quality standards and water quality target values. The Load Duration Curve (LDC) approach was selected by IDEM to calculate TMDLs for bacteria, TP and TSS. The LDC approach assigns loadings based on flow.

Bacteria (E. coli) TMDLs: For all *E. coli* TMDLs addressed by the SJRW TMDL, the *E. coli* WQS of **235 cfu/100 mL**, was used to set the loading capacity of the TMDL. IDEM believes that the single sample maximum component of the *E. coli* WQS provides the best overall characterization of the status of the watershed and that by setting the bacteria TMDLs to meet the single sample maximum the impaired waterbody will attain its designated full body contact recreational use (Section 2 of this Decision Document). EPA finds this assumption to be reasonable since the allocations of the bacteria TMDLs addressed in the SJRW TMDLs are calculated to meet the WQS of 235 cfu/100 mL on any given day, across all flow conditions within the SJRW.

Typically loading capacities are expressed as a mass per time (e.g. pounds per day). However, for *E. coli* loading capacity calculations, mass is not always an appropriate measure because *E. coli* is expressed in terms of organism counts. This approach is consistent with the EPA's regulations which define "load" as "an amount of matter that is introduced into a receiving water" (40 CFR §130.2). To establish the loading capacities for the SJRW TMDLs, IDEM used the water quality standard for *E. coli* (235 cfu/100 mL). A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards." (40 CFR §130.2). Therefore, a loading capacity set at the WQS will assure that the water does not violate WQS. IDEM's *E. coli* TMDL approach is based upon the premise that all point and nonpoint source discharges must meet the WQS when entering the waterbody. If all sources meet the WQS at discharge, then the waterbody should meet the WQS and its designated use.

IDEM approached the SJRW TMDLs by calculating loading capacity values for individual HUC-12 subwatersheds. Flow duration curves (FDC) were created for each of the subwatersheds within the SJRW. Individual FDC were developed from flow frequency tables based on Soil and Water Assessment Tool (SWAT) modeled flow values. SWAT model development, SWAT calibration and validation and quality assurance/quality control are described in the SJRW Model Report (Appendix D of the final TMDL document). SWAT modeled flow values focused on daily flow data as daily flows were necessary to implement the load duration curve approach. IDEM used daily SWAT modeled flow data compiled from dates in the recreation season (April 1 to October 31). Dates outside of the recreation season (e.g., November 1 to March 31) were excluded from the flow record for this exercise.

FDC graphs have flow duration interval (percentage of time flow exceeded) on the X-axis and discharge (flow per unit time) on the Y-axis. The FDC were transformed into LDC by multiplying individual flow values by the WQS (235 cfu/100 mL) and then by a conversion factor. The resulting points are plotted onto a load duration curve graph. LDC graphs, for the SJRW bacteria TMDLs, have flow duration interval (percentage of time flow exceeded) on the X-axis and *E. coli* loads (number of bacteria per unit time) on the Y-axis. The SJRW LDC used *E. coli* measurements in billions of bacteria per day. The curved line on a LDC graph represents the TMDL of the respective flow location and the flow conditions observed at that location.

IDEM completed water quality monitoring in the SJRW basin in 2014-2015 and measured *E. coli* concentrations at specific sampling points within the watershed. *E. coli* values from these efforts were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection and then by a conversion factor which allows the individual samples to be plotted on the same figure as the LDCs. The individual sampling loads were plotted on the same figure with the LDC.

The LDC plots were subdivided into five flow regimes; *very high flows* (exceeded 0–10% of the time), *higher flow conditions* (exceeded 10–40% of the time), *'normal' flows* (exceeded 40–60% of the time), *lower flow conditions* (exceeded 60–90% of the time), and *low flows* (exceeded 90–100% of the time). LDC plots can be organized to display individual sampling loads and the calculated LDC. Watershed managers can interpret plots with the individual sampling points with the calculated LDC to better understand the relationship between flow conditions and water quality exceedances within the watershed. Individual sampling loads which plot above the LDC represent violations of the WQS and the allowable load under those flow conditions at those locations. The difference between individual sampling loads plotting above the LDC and the LDC, measured at the same flow is the amount of reduction necessary to meet WQS.

The strengths of using the LDC method are that critical conditions and seasonal variation are considered in the creation of the FDC by plotting hydrologic conditions over the flows measured during the recreation season. Additionally, the LDC methodology is relatively easy to use and cost-effective. The weaknesses of the LDC method are that nonpoint source allocations cannot be assigned to specific sources, and specific source reductions are not quantified. Overall, IDEM believes and EPA concurs that the strengths outweigh the weaknesses for the LDC method.

Implementing the results shown by the LDC requires watershed managers to understand the sources contributing to the water quality impairment and which BMPs may be the most effective for reducing bacteria loads based on flow magnitudes. Different sources will contribute bacteria loads under varying flow conditions. For example, if exceedances are significant during high flow events this would suggest storm events are the cause and implementation efforts can target BMPs that will reduce stormwater runoff and consequently bacteria loading into surface waters. This allows for a more efficient implementation effort.

Subwatersheds in the SJRW contain multiple impaired segments which are upstream of the HUC-12 subwatershed outlet point. Instead of calculating individual loads for each upstream impaired reaches, IDEM chose to calculate TMDLs at the subwatershed outlet point of HUC-12 subwatersheds. IDEM explained the calculation of TMDLs at the subwatershed outlet addresses the entire subwatershed, including the upstream impaired segments. For bacteria impaired segments, IDEM employed a LDC based TMDL which determined bacteria loads for each of the five flow regimes of the LDC.

IDEM explained that consistency in both land use and nonpoint source contributions of bacteria across the subwatershed provided confidence that TMDL calculations at the outlet point of subwatershed would address impaired reaches upstream of the outlet point of the subwatershed. The similarities in land use and source contributions across the subwatershed will also aid post-TMDL implementation efforts. EPA anticipates that implementation efforts will be undertaken across all waters within bacteria impaired HUC-12 subwatersheds.

TMDLs were calculated for each HUC-12 subwatershed in the SJRW with bacteria impairments. WLA were assigned to individual NPDES permitted facilities and MS4 communities where appropriate in each individual subwatershed. Load allocations were calculated after the determination of the WLA, the Margin of Safety (10% of the loading capacity) and the allocation for future growth (5 % of the loading capacity). Load allocations were not split amongst individual nonpoint contributors (e.g., stormwater runoff from agricultural land use practices, failing septic systems, non-regulated urban stormwater runoff etc.). Instead, load allocations were represented as one value for each TMDL.

Table 4 of this Decision Document (attached) reports five points (the midpoints of the designated flow regime) on the loading capacity curve. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. The load duration curve method can be used to display collected bacteria monitoring data and allows for the estimation of load reductions necessary for attainment of the bacteria water quality standard. Using this method, daily loads were developed based upon the flow in the waterbody. Loading capacities were determined for the segment for multiple flow regimes. This allows the TMDL to be represented by an allowable daily load across all flow conditions. Table 4 of this Decision Document identifies the loading capacity for the waterbody at each flow regime. Although there are numeric loads for each flow regime, the LDC is what is being approved for this TMDL.

Table 4: Bacteria (*E. coli*) TMDLs for the St. Joseph River Watershed is attached

IDEM explained that, for most of the subwatersheds, measured bacteria concentrations exceed the bacteria WQS within the higher flow condition flow regime and the lower flow condition flow regime (Table 19 of the final TMDL document). IDEM concluded that bacteria inputs to waters of the SJRW likely occur across all flow conditions. Therefore, the bacteria implementation efforts should aim to reduce bacteria contributions during times of high flows and times of lower flows within the SJRW.

Table 5 of the Decision Document discusses IDEM's estimates of loading reductions for each subwatershed in the SJRW. These loading reductions were calculated from field sampling data collected in the SJRW by IDEM in 2014-2015 (Section 7.3.2 of the final TMDL document). IDEM has communicated that the loading reductions in Table 5 of this Decision Document are a conservative estimate of load reductions needed to attain TMDL targets. IDEM further explained that it would need to collect a more robust water quality data set over a variety of flow conditions for IDEM to characterize, with greater confidence, expected load reductions in the SJRW when the TMDLs are achieved.

Table 5: Estimated concentration reductions for the TMDLs in the St. Joseph River Watershed

HUC-12 Subwatershed	Estimated *E. coli* concentration reductions	Estimated Total Suspended Sediment load reductions	Estimated Total Phosphorus load reductions
Fish Creek (04100003-04)			
040100003-04-01	91%	--	--
040100003-04-02	97%	--	--
040100003-04-04	68%	--	--
040100003-04-05	89%	92%	80%
040100003-04-06	93%	--	--
Sol Shank Ditch - St. Joseph River (04100003-05)			
040100003-05-02	80%	--	--
Mason Ditch - Cedar Creek (04100003-06)			
04010003-06-01	99%	--	--
04010003-06-02	54%	--	--
04010003-06-03	--	--	--
04010003-06-04	54%	--	--
Cedar Creek (04100003-07)			
04010003-07-02	99%	44%	11%
04010003-07-04	84%	39%	--
04010003-07-05	19%	82%	--
04010003-07-06	84%	--	--
04010003-07-07	86%	95%	70%
St. Joseph River (04100003-08)			
04010003-08-02	80%	--	--
04010003-08-03	87%	--	--
04010003-08-06	--	95%	69%

EPA concurs with the data analysis and LDC approach utilized by IDEM in their calculation of wasteload allocations, load allocations, the margin of safety and the future growth calculation for the SJRW TMDLs. The methods used for determining the TMDL are consistent with U.S. EPA technical memos.[2]

Phosphorus and TSS TMDLs: TMDLs for TP and TSS were developed in a similar fashion to the bacteria TMDLs. IDEM used TP TMDLs as surrogate TMDLs for DO impaired segments and TP and

[2] U.S. Environmental Protection Agency. August 2007. *An Approach for Using Load Duration Curves in the Development of TMDLs*. Office of Water. EPA-841-B-07-006. Washington, D.C.

TSS TMDLs for IBC impaired segments in the SJRW. The WQT of 0.3 mg/L was used to set the loading capacity of the TP TMDLs and the WQT of 30 mg/L was used to set the loading capacity of the TSS TMDLs. IDEM incorporated the LDC approach to calculate pollutant loadings for each of these parameters at the outlet points of subwatersheds (HUC-12 scale) within the SJRW. Impaired reaches were assigned to their respective subwatershed based on the location of the reach within the SJRW.

Subwatersheds in the SJRW contain multiple impaired segments which are upstream of the HUC-12 subwatershed outlet point. Instead of calculating individual loads for each upstream impaired reaches, IDEM chose to calculate TMDLs at the subwatershed outlet point of HUC-12 subwatersheds. IDEM explained the calculation of TMDLs at the subwatershed outlet addresses the entire subwatershed, including the upstream impaired segments. For TP or TSS impaired segments, IDEM employed a LDC based TMDL which determined TP or TSS loads for each of the five flow regimes of the LDC.

IDEM explained that consistency in both land use and nonpoint source contributions of TP or TSS across the subwatershed provided confidence that TMDL calculations at the outlet point of subwatershed would address impaired reaches upstream of the outlet point of the subwatershed. The similarities in land use and source contributions across the subwatershed will also aid post-TMDL implementation efforts. EPA anticipates that implementation efforts will be undertaken across all waters within TP or TSS impaired HUC-12 subwatersheds.

SWAT modeled flow values were incorporated to develop FDC and combined with water quality monitoring in the SJRW basin in 2014-2015 and measured TP and TSS concentrations at specific sampling points within the watershed. TP and TSS values from these efforts were converted to individual sampling loads by multiplying the sample concentration by the modeled flow values estimated at the time of sample collection. The individual sampling loads were plotted on the same figure with the LDC.

The LDC plots were subdivided into five flow regimes; very high flows, moist conditions, ‘normal’ range flows, dry conditions, and low flows. LDC plots can be organized to display individual sampling loads and the calculated LDC. Watershed managers can interpret these plots (individual sampling points plotted with the LDC) to understand the relationship between flow conditions and water quality exceedances within the watershed. Individual sampling loads which plot above the LDC represent violations of the WQT and the allowable load under those flow conditions at those locations. The difference between individual sampling loads plotting above the LDC and the LDC, measured at the same flow is the amount of reduction necessary to meet WQT.

TMDLs were calculated for each subwatershed in the SJRW. WLA were assigned to NPDES permitted facilities, MS4 communities, construction stormwater and industrial stormwater where appropriate in each individual subwatershed. Load allocations were calculated after the determination of the WLA, the Margin of Safety (5% of the loading capacity) and the allocation for future growth (5% of the loading capacity). Load allocations were not split amongst individual nonpoint contributors (ex. stormwater runoff from agricultural land use practices, failing septic systems, urban stormwater runoff etc.). Instead, load allocations were represented as one value for each TMDL. EPA is approving the load(s) expressed in the current TMDLs.

IDEM explained that, for most of the subwatersheds, measured TP and TSS concentration measurements exceed the TP and TSS water quality targets within the very high flow conditions, the higher flow condition flow regime and the lower flow condition flow regime. IDEM concluded that the TP and TSS inputs to waters of the SJRW likely occur across all flow conditions. Therefore, the nutrient and sediment implementation efforts should aim to reduce nutrient and sediment contributions during times of high flows and times of lower flows within the SJRW.

Table 6: Total Phosphorus TMDLs for the St. Joseph River Watershed is attached

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Table 7: Total Suspended Solid (TSS) TMDLs for the St. Joseph River Watershed is attached

Table 5 of the Decision Document discusses IDEM's estimates of TP and TSS loading reductions for subwatersheds in the SJRW. These loading reductions were calculated from field sampling data collected in the SJRW by IDEM in 2014-2015. IDEM has communicated that the loading reductions in Table 5 of this Decision Document are a conservative estimate of load reductions needed to attain TMDL targets. IDEM further explained that it would need to collect a more robust water quality data set over a variety of flow conditions for IDEM to characterize, with greater confidence, expected load reductions in the SJRW when the TMDLs are achieved.

EPA concurs with the data analysis and LDC approach utilized by IDEM in its calculation of wasteload allocations, load allocations, the margin of safety and the future growth calculation for the SJRW TMDLs. The methods used for determining the TMDL are consistent with U.S. EPA technical memos.[3]

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of the third criterion.

4. Load Allocations (LA)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

<u>Comment:</u>
LAs for nonpoint sources were calculated in the TMDL development process, along with the calculations for the load assigned to the WLA and the margin of safety. IDEM determined the load allocation calculations for each of the subwatershed TMDLs based on the *E. coli* WQS (235 cfu/100 mL) and the WQT for TP (0.3 mg/L) and TSS (30 mg/L). The WQS and WQT were applicable across all flow conditions in the subwatershed (Tables 4, 6 and 7 of this Decision Document).

[3] U.S. Environmental Protection Agency. August 2007. *An Approach for Using Load Duration Curves in the Development of TMDLs*. Office of Water. EPA-841-B-07-006. Washington, D.C.

IDEM identified several nonpoint sources in this TMDL report. Loadings for the three pollutants were recognized as originating from many diverse nonpoint sources including; urban stormwater runoff, failing septic systems, stormwater runoff from agricultural land use practices, livestock with access to stream areas, stream channelization and stream erosion, and wildlife (deer, geese, ducks, raccoons, turkeys and other animals). IDEM did not determine individual load allocation values for each of these potential nonpoint source considerations.

The implementation strategies outlined by IDEM in the SJRW TMDL and WMPs developed for the SJRW (see Section 8 of this Decision Document) will aid local partners in determining appropriate mitigation strategies for these nonpoint source inputs. Additional sources of information which may be called upon by IDEM to aid in setting mitigation strategies are field observations made during the collection of water quality monitoring data in 2014-2015. These observations (e.g., land use, housing density, location of livestock facilities and proximity to sampling locations) may assist watershed managers in identifying potential nonpoint sources of bacteria, TP and TSS. EPA finds the IDEM's approach for calculating the LA to be reasonable.

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of the fourth criterion.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:
IDEM identified NPDES permit holders in Table C-3 in Appendix C of the final TMDL document. These individual permittees received a WLA assigned to mitigate bacteria, nutrient (TP) or sediment (TSS) inputs (Tables 4, 6 and 7 of the Decision Document). A majority of the WLAs calculations were based on each facility's design flow and the TMDL target value, bacteria (*E. coli* WQS of 235 cfu/100

mL), total phosphorus (concentration target of 1.0 mg/L) and total suspended solid (concentration target of 30 mg/L).

IDEM expects each NPDES permitted facility to meet the targets assigned by the WLA across all flow conditions. EPA expects that IDEM permit writers will work with R5 NPDES staff to revise individual NPDES permits, based on the bacteria, TP and TSS targets identified in this TMDL during the next permitting cycle. EPA notes that permit limits and permit conditions will be determined through the NPDES permit process. EPA's November 15, 2006 memorandum states that 40 CFR. § 122.44(d)(1)(vii) requires the permitting authority to ensure that "*…effluent limitations developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available waste load allocation for the discharge prepared by the State and approved by EPA pursuant to 40 CFR. 130.7. This provision does not require that effluent limits in NPDES permits by expressed in a form that is identical to the form in which an available waste load allocation for the discharge is expressed in a TMDL. Rather, permit limits need only be consistent with the assumptions and requirements of a TMDL's waste load allocation*." [4]

There were a few instances where IDEM did not calculate WLAs based on the facility's design flow multiplied by the TMDL target (e.g., 235 cfu/100 mL, 1.0 mg/L or 30 mg/L). IDEM found that in certain subwatersheds the WLA calculations which used the design flow multiplied by the TMDL target for the *low flows* flow regime resulted in exceedances of the loading capacity value for the *low flow* TMDL. Specifically, the TP TMDLs for Cedar Creek (04100003-07-07) and the St. Joseph River (04100003-08-06) (Table 6 of this Decision Document) required IDEM to recalculate WLAs for certain facilities (see below) which were not based on design flow values but rather on average actual flow values. Those facilities were;

Cedar Creek (04100003-07-07) TP TMDL: Auburn WWTP (IN020672), Avila WWTP (IN0020664), Corunna WWTP (IN0047473), Garrett Municipal WWTP (IN0022969) and Indian Springs Recreation Campground (IN0032107)

St. Joseph River (04100003-08-06) TP TMDL: Butler WWTP (IN0022462) and St. Joe Spencerville RSD (IN0058441)

For the above seven facilities in the 04100003-07-07 and the 04100003-08-06 TP TMDLs, IDEM calculated individual WLAs in the *low flows* flow regime by using average actual flow values, reported in discharge monitoring reports from July through September, instead of average design flows. The average actual flow values were multiplied by the TMDL TP target value (1.0 mg/L) to calculate the WLA for that facility in the *low flows* flow regime only (Table 6 of this Decision Document). IDEM determined that employing the average actual flows from July 1 through September 30 was appropriate for the *low flows* flow regime because these sanitary wastewater treatment facilities discharge at a small fraction of their average design flows during summer low-flow periods (i.e., July through September).

IDEM feels that using average actual flow estimates to help set WLAs serve to best characterize the flow conditions in the receiving water during the *low flows* flow regime. IDEM expects each NPDES

[4] EPA Memorandum 'Establishing TMDL "Daily" Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit *in Friends of the Earth Inc. v. EPA, et al.*, No. 05-5015, (April 25, 2006) and implications for NPDES permits (November 15, 2006) (emphasis added).

permitted facility to meet the targets assigned in the approved WLA across all flow conditions. EPA expects that IDEM permit writers will work with R5 NPDES staff to revise individual NPDES permits, based on the bacteria, TP and TSS targets identified in this TMDL during the next permitting cycle.

IDEM explained that its NPDES staff will monitor future DMRs from NPDES facilities in the SJRW, especially during lower flow conditions, typically July 1- September 30. IDEM NPDES staff will be monitoring whether effluent flows from those facilities are at volumes below the flow volumes employed to calculate WLA in *low flows* flow regime.

EPA's approval of the SJRW TMDLs is confined to the loading capacity endpoints of the TMDL equation (WLA + LA + MOS = TMDL). EPA is not taking a position on IDEM's methodology for calculating these loading endpoints. In the case of the WLA calculations, EPA's TMDL approval is not a formal endorsement of IDEM's use of certain TMDL effluent target values (i.e., TP's TMDL target concentration value of 1.0 mg/L) nor IDEM's use of different flow endpoints (i.e., average actual flow estimates) employed during IDEM's calculation of individual WLAs for specific facilities. EPA believes that WLAs, from approved TMDLs, will be applied to NPDES permits via the permitting process and that any revisions to permits addressed in the SJRW TMDLs will need to be consistent with the approved WLAs. EPA notes that the NPDES permitting process will ultimately set the final conditions.

<u>Industrial stormwater contributions covered by individual permits:</u>
Industrial stormwater WLAs for individual facilities were calculated based on a ratio of the regulated area of the facility and the overall area of the TMDL subwatershed. IDEM explained that an individual facility's regulated area is the area of the parcel that the address of the permittee is associated with and adjacent parcels if such parcels are owned by the same entity (Section 7.2.4.2 of the final TMDL document). The ratio of the industrial facility's regulated area divided by the TMDL subwatershed area was rounded up to the next one-tenth of a percent and then multiplied by the loading capacity, less the summation of non-stormwater WLAs, MOS and AFG. Individual WLAs applied to all flow regimes in the LDC framework unless there were specific language included within the NPDES permit or other IDEM communication/direction to exclude the application of the WLAs across all flow regimes.

<u>Construction and industrial stormwater contributions covered by general permits:</u>
IDEM calculated construction and industrial stormwater contributions based on areas in the Indiana portion of the SJRW which are recognized as construction or industrial sites (Appendix G of the final TMDL document). On a subwatershed basis, IDEM summed the areas covered under construction stormwater permits and developed a ratio of those areas to the overall subwatershed area. This ratio was then multiplied by the loading capacity, minus the summation of non-stormwater WLAs, MOS and AFG (Section 7.2.4.6 of the final TMDL document). This calculation approximated the WLA assigned to construction stormwater. The industrial stormwater WLAs were calculated in a similar fashion to the construction stormwater WLAs with the exception being that industrial stormwater areas were summed and applied toward the development of the ratio which estimates the areas covered under industrial stormwater permits versus of the overall subwatershed area.

<u>MS4s:</u>
IDEM identified MS4 jurisdictional areas within the SJRW and completed a similar areal ratio calculation for MS4 communities as had been completed for construction stormwater and industrial stormwater. This ratio allowed IDEM to estimate potential MS4 contributing areas on a subwatershed-

by-subwatershed basis. This value was then multiplied by the loading capacity, minus the summation of non-stormwater WLAs, MOS and AFG (Section 7.2.4.7 of the final TMDL document).

Combined Sewer Overflows:
There are three facilities which contain CSO outfalls within the SJRW, the Auburn WWTP (IN0020672), the Butler WWTP (IN0022462) and the Fort Wayne WWTP (IN0032191). CSOs were assigned a 0.0 discharge (WLA = 0) (Tables 4, 6 and 7 of this Decision Document). IDEM explained that it believes that efforts to minimize CSO inputs to surface waters of the SJRW are best addressed by Long Term Control Plans and conditions outlined in the facility's NPDES permit (Section 8.3.2 of the final TMDL document). Therefore, during internal discussions between the IDEM TMDL staff and IDEM NPDES staff in 2017, IDEM concluded that numeric CSO WLAs should be set to 0.0. IDEM noted that while the WLAs were set to 0.0 for the three pollutants, this does not mean CSO discharges are proscribed. The cities are working on implementing their Long Term Control Plans with EPA and IDEM to address the long-term control of CSO discharges to surface waters in the SJRW. IDEM acknowledged that all CSO elimination/implementation efforts should adhere to the conditions of the LTCP.

Sanitary Sewer Overflows:
There is one SSO facility, the Fort Wayne Municipal WWTP (IN0032191), within the SJRW. IDEM did not assign this facility a portion of the WLA (WLA = 0 cfu per 100 mL or WLA = 0.0 lbs./day) because SSOs are not authorized.

EPA finds the IDEM's approach for calculating the WLA to be reasonable.

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of the fifth criterion.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comment:
The SJRW bacteria (*E. coli*), nutrient (TP) and sediment (TSS) TMDLs incorporated an explicit Margin of Safety (MOS) (Section 7.2.6 of the final TMDL document). The bacteria TMDLs employed an explicit MOS of 10% of the total loading capacity, while the TP and sediment TMDLs employed an explicit MOS of 5% of the total loading capacity (Tables 4, 6 and 7 of this Decision Document).

The use of the LDC approach minimized variability associated with the development of the SJRW TMDLs because the calculation of the loading capacity was a function of flow multiplied by the target value. The MOS was set at 5% and 10% to account for uncertainty due to field sampling error, basing assumptions on water quality monitoring with low sample sizes, and imperfect WQT. A 5% and 10% MOS was considered appropriate, because the target values used in this TMDL had a firm technical basis and the daily SWAT modeled flows are believed to accurately represent actual flow conditions in the SJRW (Appendix D of the final TMDL document).

The MOS for the SJRW bacteria TMDLs also incorporated certain conservative assumptions in the calculation of the TMDLs. No rate of decay, or die-off rate of pathogen species, was used in the SJRW bacteria TMDL calculations or in the creation of load duration curves for *E. coli*. Bacteria have a limited capability of surviving outside their hosts, and normally a rate of decay would be incorporated. IDEM determined that it was more conservative to use the WQS (235 cfu/100 mL) and not to apply a rate of decay, which could result in a loading capacity greater than the WQS.

As stated in *EPA's Protocol for Developing Pathogen TMDLs* (EPA 841-R-00-002, January 2001), many different factors affect the survival of pathogens, including the physical condition of the water. These factors include, but are not limited to sunlight, temperature, salinity, and nutrient deficiencies. These factors vary depending on the environmental condition/circumstances of the water, and therefore it would be difficult to assert that the rate of decay caused by any given combination of these environmental variables was sufficient enough to meet the WQS of 235 cfu/100 mL and 235 cfu/100ml. Thus, it is more conservative to apply the State's WQS in determining bacteria TMDLs, because this standard must be met at all times under all environmental conditions.

The U.S. EPA finds that the TMDL document submitted by IDEM contains an appropriate MOS satisfying the requirements of the sixth criterion.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comment:
The SJRW bacteria (*E. coli*), nutrient (TP) and sediment (TSS) TMDLs incorporated seasonal variation into the development of the TMDLs via the following methods:

Bacteria (E. coli) TMDLs: Bacterial loads vary by season, typically reaching higher numbers in the dry summer months when low flows and bacterial growth rates contribute to their abundance, and reaching relatively lower values in colder months when bacterial growth rates attenuate and loading reduces as agricultural activity slows. Bacterial WQS need to be met during the recreational season (April 1st to October 31st), regardless of the flow condition. The development of the LDCs utilized flow measurements from daily SWAT modeled flows which were representative of a variety of flow conditions. LDCs developed from these modeled conditions represented a range of flow conditions within the SJRW and thereby accounted for seasonal variability over the recreation season. TMDL loads were based on sampling that occurred during the recreational season in 2014-2015. Seasonal variability was accounted for by taking multiple samples per month during the recreational season.

Critical conditions for *E. coli* loading occur in the dry summer months. This is typically when stream flows are lowest, and bacterial growth rates can be high. The State of Indiana does not have an applicable full body contact *E. coli* water quality standard for the remainder of the calendar year (November 1 through March 31). By meeting the WQS during the summer recreation season, it can reasonably be assumed that the loading capacity values would be protective of water quality during the remainder of the calendar year (November through March).

<u>Phosphorus and TSS TMDLs:</u> Nutrient and sediment influxes to waters in the SJRW typically occur during wet weather events. Critical conditions that impact the response of surface waters in the SJRW to nutrient and sediment inputs occur during periods of low flow. Nutrient and sediment inputs to surface waters typically occur primarily through wet weather events. Two significant land uses in the SJRW are agricultural and pasture lands (Table 2 of this Decision Document). Nutrient and sediment loadings from agricultural and pasture lands will vary depending on the agricultural activities on site and the presence or absence of BMPs to minimize stormwater runoff from these areas.

Sediment loading to surface waters in the SJRW varies depending on surface water flow, land cover and climate/season. Typically, in the SJRW, sediment is being moved from terrestrial source locations into surface waters during or shortly after wet weather events. Spring is typically associated with large flows from snowmelt, the summer is associated with the growing season as well as periodic storm events and receding streamflows, and the fall brings increasing precipitation and rapidly changing agricultural landscapes.

Critical conditions that impact loading, or the rate that sediment is delivered to the waterbody, were identified as those periods where large precipitation events coincide with periods of minimal vegetative cover on fields. Large precipitation events and minimally covered land surfaces can lead to large runoff volumes, especially to those areas which drain agricultural fields. The conditions generally occur in the spring and early summer seasons.

Additionally, low flow periods can impact the water quality in waterbodies of the SJRW. During low flow periods, TP and sediment can accumulate, there is less assimilative capacity within the waterbody, and generally TP and sediment are not transported through the waterbody at the same rate they are under normal flow conditions.

Increased algal growth during low flow periods can deplete dissolved oxygen within the water column. Critical conditions that impact loading, or the rate that nutrients are delivered to the waterbody, were identified as those periods where large precipitation events coincide with periods of minimal vegetative cover on fields. Large precipitation events and minimally covered land surfaces can lead to large runoff volumes, especially to those areas which drain agricultural fields. The conditions generally occur in the spring and early summer seasons.

The TP and TSS TMDLs account for varying loads and critical conditions by employing the LDC framework and daily SWAT modeled flows. The SWAT modeling conditions represented a range of flow conditions in the SJRW and thereby accounted for seasonal variability over the entire calendar year. TMDL loads were based on sampling that occurred during the recreational season in 2014-2015.

Seasonal variability was accounted for by taking multiple samples per month during the recreational season.

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of the seventh criterion.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a NPDES permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comment:
A discussion of reasonable assurance is provided in Section 8 of the final TMDL document. Many of the activities and actions identified in the TMDL and watershed management planning documents will be applied in TMDL subwatersheds in the Indiana portion of the SJRW. The recommendations made by IDEM in the SJRW TMDL and by outside groups (e.g., the St. Joseph River Watershed Initiative) in various watershed management planning documents will lead to improved water quality if appropriate groups work to implement these recommendations. Those mitigation suggestions which fall outside of regulatory authority will require commitment from state agencies and local stakeholders to carry out the suggested actions.

IDEM has identified several local partners which have expressed interest in working to improve water quality within the SJRW. Some of these partners include: the St. Joseph River Watershed Initiative (SJRWI), Allen County Soil and Water Conservation District (SWCD), DeKalb County SWCD, Noble County SWCD, Steuben County SWCD, the City of Fort Wayne Water Utilities Department, The Nature Conservancy (TNC), US Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) and the Indiana Department of Natural Resource (IDNR).

The SJRWI has been significantly involved in the development of watershed management planning documents for the Indiana portions of SJRW. To date SJRWI has developed four SJRW WMPs for various HUC-10 scale subwatersheds in the SJRW, the St. Joseph River WMP (2006), the Lower St. Joseph – Bear Creek WMP (2008), the Middle St. Joseph River WMP (2011) and the Upper St. Joseph River WMP (2012). IDEM believes that the efforts of the SJRWI (http://www.sjrwi.org/) in supporting these WMP development efforts and other local implementation activities in the SJRW demonstrate SJRWI's continued commitment toward restoration of water quality in the SJRW. The SJRWI's webpage describes various programs for local citizens to become involved in protecting the surface water resources of the SJRW. For example, the SJRWI is engaged in ongoing education and outreach efforts (e.g., stakeholder meetings, newsletters, educational workshops on BMPs which target pollutant loading from urban and agricultural sources and social surveys) to increase overall awareness of water quality challenges in the SJRW.

Continued water quality monitoring within the basin is supported by IDEM. Additional water quality monitoring results will provide understanding of the success or failure of BMP systems designed to reduce bacteria, nutrient, and sediment loading into the surface waters of the watershed. Local watershed managers will be able to reflect on the progress or lack of progress of the various pollutant removal strategies and will have the opportunity to change course if observed progress is unsatisfactory. The SJRWI completes water quality monitoring on the main stem of the St. Joseph River and its tributaries during April to October. Additionally, the SJRWI has volunteer water quality monitoring programs which align with Hoosier Riverwatch monitoring programs to enable local citizens can get involved and better understand the water quality conditions of the SJRW.

Reasonable assurance that the WLA set forth will be implemented is provided by regulatory actions. According to 40 CFR 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. IDEM's stormwater program, NPDES permit program, and CSO program are the main implementing programs for ensuring WLA are consistent with the TMDL. Stormwater runoff associated with MS4 conveyances are regulated by 327 IAC 15-13-1 (Rule 13). Local stormwater efforts can also provide reasonable assurance that stormwater inputs are being targeted by local MS4 partners. Local cities and towns will need to work with IDEM's stormwater program to advance the goals outlined in the various SJRW Watershed Management Plans (2006 – 2012).

Examples of activities which provide reasonable assurance that nonpoint source reductions will be achieved for bacteria (*E. coli*), TP, and sediment are described in Section 8 of the TMDL. The SJRW TMDL implementation efforts will be achieved through federal, state and local action. Federal funding, via the Section 319 grants program, can provide money to implement voluntary nonpoint source programs within the watershed. As stated earlier, the SJRWI and local SWCDs have been active in developing WMPs. The four established WMPs outline practices designed to reduce pollutant inputs through the implementation of BMPs. The main efforts of these WMPs include; the identification and mitigation of riparian erosional areas within the urban/suburban areas in the SJRW, reducing soil erosion from agricultural areas, stormwater peak flow reduction, and wetland restoration or construction. The WMPs focus on reducing sediment, nutrient and bacteria loads, while aiming to decrease flow volumes to local surface waterbodies during storm events.

Other state led efforts will be via NPDES permit enforcement, the IDEM Stormwater Program, the IDEM Nonpoint Source program and various other land and water resource protection efforts sponsored by state agencies.

The U.S. EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:
IDEM completed a comprehensive biological, physical and chemical survey of streams within the SJRW in 2014-2015 as part of its basin monitoring schedule. Water quality data were collected at various locations within the SJRW and those assessments were utilized to develop the TMDLs in this report. Water quality monitoring in the SJRW is anticipated to continue by voluntary monitoring efforts organized at the local level (e.g., near Fort Wayne, the SJRWI and the City of Fort Wayne have ongoing monitoring of the main stem of the St. Joseph River and select tributaries, additionally the SJRWI has volunteer water quality monitoring opportunities too).

Future monitoring in the SJRW will also occur on IDEM's nine-year rotating basin schedule or once TMDL implementation BMPs are incorporated in the watershed. The IDEM monitoring efforts are designed to assess water quality improvements with respect to bacteria (*E. coli*), nutrient and sediment concentrations. Monitoring will be adjusted as needed to assist in continued source identification and elimination and will also gage the efficiency of pollution reduction strategies.

During the monitoring period, watershed managers will determine the appropriate monitoring cycle for the SJRW. The monitoring schedule will be adjusted, as needed, to improve source identification and source elimination efforts. IDEM will monitor whether bacteria (*E. coli*), nutrient and sediment targets are being achieved and adjust the SJRW BMP strategy as needed to meet these water quality targets. When results indicate that the waterbody is meeting the appropriate WQS and targets, the waterbody will be removed from Indiana's List of Impaired Waters.

The U.S. EPA finds that this criterion has been adequately addressed.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment:
The focus of implementation strategies will be the reduction of bacterial, nutrient, and sediment inputs to the surface waters in the SJRW. Local partners, such as the SJRWI, Allen County SWCD and other county SWCD partners (i.e., DeKalb, Noble and Steuben) will bear the responsibility for assisting in the management of lands and waters within the SJRW. These partners will also be tasked with finding creative adaptive management strategies to meet changing water quality conditions within the watershed. The focus of all of the implementation strategies will be to reduce bacterial, nutrient, and sediment inputs to the surface waters in the SJRW The main bacterial, nutrient and sediment reduction strategies include:

Bacteria (E. coli TMDLs):
Septic System Improvements: Local septic management programs and educational opportunities can aid in the reduction of septic pollution. Educating the public on proper septic maintenance, finding and eliminating illicit discharges and repairing failing systems could lessen the impacts of septic derived bacterial inputs to the SJRW.

Reducing Livestock Access to Stream Environments: The installation of exclusion fencing near stream and river environments to prevent direct access for livestock, installing alternative water supplies, and installing stream crossings between pastures, would reduce the influxes of bacteria and improve water quality within the watershed.

Manure Collection and Storage Practices: Manure has been identified as a source of bacteria. Bacteria can be transported to surface waterbodies via stormwater runoff. Bacteria laden water can also leach into groundwater resources. Improved strategies for the collection, storage and management of manure can minimize impacts of bacteria entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the amount of bacteria in stormwater runoff.

Riparian Area Management Practices: Protection of streambanks within the watershed through planting of vegetated/buffer areas with grasses, legumes, shrubs or trees will mitigate bacteria inputs into surface waters. These areas will filter stormwater runoff before the runoff enters the main stem or tributaries of the SJRW.

Agricultural Land Management Practices: Runoff from cropland and pastures combined with the application of manure to fields in the late summer are a likely source of bacteria found in stormwater runoff from agricultural areas. Planting vegetation along riparian areas (riparian buffers) will aid to slow down water and allow it to filter through the vegetation before entering surface water environments.

Phosphorus TMDLs:
Septic System Improvements: Local septic management programs and educational opportunities can aid in the reduction of septic pollution. Educating the public on proper septic maintenance, finding and eliminating illicit discharges and repairing failing systems could lessen the impacts of septic derived nutrient inputs to the SJRW.

Urban/Residential Nutrient Reduction Strategies: These strategies involve reducing stormwater runoff from urban areas and single family residences within the SJRW. These practices could include; rain gardens, lawn fertilizer reduction, planting buffer strips near waterbodies, vegetation management and replacement of failing septic systems. Water quality educational programs could also be utilized to inform the general public on nutrient reduction efforts and their impact on water quality.

Agricultural Reduction Strategies: These strategies involve reducing nutrient transport from fields and minimizing soil loss. Specific practices would include; planting buffer strips near streams and lakes, streambank stabilization practices (gully stabilization and installation of fencing near streams), wetland restoration, and nutrient management planning.

Improved Agricultural Drainage Practices: A review of local agricultural drainage networks should be completed to examine how improving drainage ditches and drainage channels could be reorganized to reduce the influx of nutrients to the surface waters in the SJRW. The reorganization of the drainage network could include the installation of drainage ditches or sediment traps to encourage particle settling during high flow events. Additionally, cover cropping and residue management is recommended to reduce erosion and thus siltation and runoff into streams.

Public Education Efforts: Public programs will be developed to provide guidance to the general public on nutrient reduction efforts and their impact on water quality. These educational efforts could also be used to inform the general public on what they can do to protect the overall health of the SJRW. Local watershed partners (ex. the Allen County SWCD, along with others) could assume additional responsibilities in communicating nutrient reduction strategies to stakeholders, via mailing annual newsletters or updating their website with nutrient reduction strategies.

TSS TMDLs:

Reducing stormwater peak flows within surface waterbodies in the SJRW is the primary recommendation for reducing sediment loads in the watershed. Streamside buffering, particularly via wetland restoration or construction, is a recommended practice that would reduce both sediment and other related pollutant loads, and in some cases may help mitigate flow alteration by maximizing infiltration rates.

Urban-suburban Stormwater Mitigation Efforts: Reducing peak flow stormwater inputs within the SJRW would aid in reducing erosion and streambank losses within the watershed. This practice may be accomplished via reducing impervious cover or employing other low impact development/ green technologies which allow stormwater to infiltrate, evaporate or evapotranspire before reaching the stormwater conveyance system.

Identification of Stream, River, and Lakeshore Erosional Areas: An assessment of stream channel, river channel, and lakeshore erosional areas should be completed to evaluate areas where erosion control strategies could be implemented in the SJRW. Implementation actions (ex. planting deep-rooted vegetation near waterbodies to stabilize streambanks) could be prioritized to target areas which are actively eroding. This strategy could prevent additional sediment inputs into surface waters of the SJRW and minimize or eliminate degradation of habitat.

Improved Agricultural Drainage Practices: A review of local agricultural drainage networks should be completed to examine how improving drainage ditches and drainage channels could be reorganized to reduce the influx of sediments to the surface waters in the SJRW. The reorganization of the drainage network could include the installation of drainage ditches or sediment traps to encourage particle settling during high flow events. Additionally, cover cropping and residue management is recommended to reduce erosion and thus siltation and runoff into streams.

Reducing Livestock Access to Stream Environments: Livestock managers should be encouraged to implement measures to protect riparian areas. Managers should install exclusion fencing near stream environments to prevent direct access to these areas by livestock. Additionally, installing alternative watering locations and stream crossings between pastures may aid in reducing sediments to surface waters.

The U.S. EPA finds that this criterion has been adequately addressed. The U.S. EPA reviews but does not approve implementation plans.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comment:
The public participation section of the TMDL submittal is found in Section 10 of the final TMDL document. Throughout the development of the SJRW TMDLs the public was given various opportunities to participate. A draft TMDL meeting was held on January 31, 2017 at the Allen County SWCD office in Fort Wayne, Indiana. During this meeting IDEM described the results of the draft TMDL. The public was invited to submit formal comments on the draft document and informed of the findings of the document.

IDEM posted the draft TMDL report online at (http://www.in.gov/idem/nps/3918.htm) for a public comment period. IDEM held two public comment periods for the SJRW TMDL, the first 30-day public period was started on January 11, 2017 and ended on February 10, 2017. The second 30-day public period was started on May 12, 2017 and ended on June 12, 2017. IDEM received one public comment during the first public notice period from the City of Fort Wayne. IDEM received one public comment during the second public notice period from the City of Fort Wayne.

During the first public notice period, the City of Fort Wayne requested further detail on IDEM's nutrient target (0.3 mg/L) and TSS target (30 mg/L) employed for the SJRW TMDLs, additional information on load reduction estimates for BMPs, additional detail on SWAT modeling as it pertains to bacteria TMDLs, additional detail on how IDEM calculated stormwater WLA, nonpoint source pollution and the attainment of TMDL end goals, and CSO WLAs and how those link to ongoing CSO mitigation efforts (i.e., Long Term Control Plans and Consent Decrees) and NPDES permits. The City of Fort Wayne also provided edits and updated source information regarding permittees. IDEM answered the City of Fort Wayne's comments and requests submitted during the first public notice period and updated language and discussion within the subsequent draft SJRW TMDL. Details of IDEM's responses to the City of Fort Wayne are found in IDEM's response letter dated May 5, 2017.

During the second public notice period, the City of Fort Wayne requested clarification on how IDEM uses water quality data to designate segments on its 303(d) list, clarification on how IDEM completes its segmentation process for individual reaches, explanation on how the Western Lake Erie Annex 4 Domestic Action Plan interacts with the SJRW TMDLs, further explanation of nonpoint source reductions called for in the TMDL and the voluntary nature of nonpoint source participation. IDEM answered the City of Fort Wayne's comments on the 2nd public notice draft of the SJRW TMDL and updated language within the final SJRW TMDL accordingly. Details of IDEM's responses to the City of Fort Wayne are found in IDEM's response letter dated August 8, 2017.

EPA believes that IDEM adequately addressed the comments received during the public notice periods and where necessary updated the TMDL document in response to those comments. IDEM submitted all public comments and responses to those comments in its final TMDL submittal packet received by the EPA on August 9, 2017.

The U.S. EPA finds that the TMDL document submitted by IDEM satisfies the requirements of this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment:
The U.S. EPA received the final SJRW TMDL document, submittal letter and accompanying documentation from IDEM on August 9, 2017. The transmittal letter explicitly stated that the final TMDLs referenced in Table 1 of this Decision Document were being submitted to EPA pursuant to Section 303(d) of the Clean Water Act for EPA review and approval.

The letter clearly stated that this was a final TMDL submittal under Section 303(d) of CWA. The letter also contained the name of the watershed as it appears on Indiana's 303(d) list, and the causes/pollutants of concern. This TMDL was submitted per the requirements under Section 303(d) of the Clean Water Act and 40 CFR 130.

The U.S. EPA finds that the TMDL transmittal letter submitted for St. Joseph River Watershed by IDEM satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the U.S. EPA finds that the TMDLs submitted for the St. Joseph River Watershed satisfy all of the elements of approvable TMDLs. This approval is for **fifty-nine (59) bacteria TMDLs, fifteen (15) nutrient TMDLs, and twelve (12) TSS TMDLs**. These **eighty-six (86) TMDLs** address impaired waterbodies in twelve HUC-12 subwatersheds for recreational use and aquatic life use impairments. Refer to Table 1 of this Decision Document for subwatershed and AUID details.

The U.S. EPA's approval of these TMDLs extend to the waterbodies which are identified within the SJRW, with the exception of any portions of the waterbodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. The U.S. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. The U.S. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.