

Detailed Analysis of Indiana's Section 303(d) List and the State's Integrated Report (IR) Submittal for 2020

Consistent with EPA's IR Guidance, Indiana submits an Integrated Water Monitoring and Assessment Report every two years which combines the listing requirements of Sections 303(d), 305(b) and 314 of the Clean Water Act. The Indiana Department of Environmental Management (IDEM) submitted its 2020 IR on January 19, 2021.¹

IDEM's 2020 IR submittal to EPA included the following information:

- Submission Cover Letter
- IR Narrative
- IR Tables (*Appendix A*)
- IR Figures (*Appendix B*)
- IR Metadata and Definitions (*Appendix C*)
- IR Monitoring, Assessment, Reporting and Listing Schedule (*Appendix F*)
- IR Comprehensive Use Assessments (*Appendix H*)
- IR Consolidated List (Categories 1-5) (*Appendix M; and 2020 IR data in ATTAINS*)
- IR Lake Trophic Status and Trends (*Appendix I*)
- Indiana's 303(d) List of Impaired Waters
 - 303(d) Narrative (*Appendix J*)
 - 303(d) Related Tables (*Appendix L*)
 - IDEM's Finalized 303(d) List of Impaired Waters (Category 5) (*2020 IR data in ATTAINS*)
 - IDEM's Consolidated Assessment and Listing Methodology (CALM) (*Appendix G*)
 - Status of Category 4 Waters (*Appendix D*)
 - Indiana's TMDL Development Schedule (*Appendix E*)
 - USEPA comments and IDEM's responses to USEPA comments on the 303(d) List of Impaired Waters (*Appendix K*)²

A. IDEM's Water Quality Assessment and Listing Methodology³

Indiana's IR identifies waterbody segments or assessment units (AUs) that are associated with individual waterbodies within a 12- or 14-digit hydrologic unit code (HUC) watershed that ranges in size from less than five acres (less than one square mile) to about 28,000 acres (almost 44 square miles). These waterbody AUs are assigned a unique identifier (AU ID) in the Assessment, Total Maximum Daily Load (TMDL) Tracking and Implementation System (ATTAINS) with which all the assessment information for that waterbody is associated. Indiana lakes and reservoirs, including open waters of Lake Michigan, are assigned a single AU ID with sizes reported in acres. Indiana's Lake

¹ On January 19, 2021, EPA received Indiana's IR package (including its final 2020 Section 303(d) list) that was submitted through the ATTAINS, which is EPA's new electronic system to accept and track 303(d) submissions and actions. ATTAINS submittal includes directly entered assessment data as well as uploaded documents.

² Additional information in response to EPA comments was submitted in email to Vilma Rivera-Carrero from Jody Arthur dated 09/08/2020.

³ There were no significant changes made to Indiana's Water Quality Assessment and Listing Methodology between the 2018 and 2020 cycles. See *Appendix G* of IN's 2020 IR.

Michigan shoreline is divided and assigned AU IDs in accordance with the 8-digit HUC in which they are located and are reported in miles. Rivers and streams are assigned AU IDs in accordance with the 12- or 14-digit HUC in which they are located and are reported in miles. For large rivers with more than 1,000 square miles of drainage area, the AU IDs for mainstem non-wadeable reaches within their 12- or 14-digit HUCs are distinguished from those smaller, wadeable streams so that issues such as sampling techniques, which might bias results, can be considered within a class of streams. With regard to Indiana's flowing waters, AU sizes vary widely, and a single segment may or may not represent the entire river or stream with which it is associated.

In order to assess the quality of Indiana's waters, IDEM developed a surface water quality monitoring strategy which calls for monitoring each of Indiana's major water management 9 basins on a 9-year rotating basis⁴ using the state's data-collection sampling programs (Watershed Monitoring, Fixed Station Monitoring, *E. coli* Monitoring, Fish Community Monitoring, Fish Tissue Monitoring, Macroinvertebrate Community Monitoring, Special Projects, and Clean Lakes). The water quality assessment process is applied to each data-collection sampling program. The individual assessments are then integrated into a comprehensive assessment for each waterbody AU by use designation: aquatic life support, fish consumption, drinking water supply, and recreational use.

Water quality assessments are done by evaluating and coordinating data from site specific chemical (water, sediment and fish tissue), physical (habitat, flow data), and biological (fish community, macroinvertebrates, and *E. coli*) monitoring of Indiana's rivers, streams, and lakes. Chemical data for toxicants (metals⁵, polynuclear aromatic hydrocarbons (PAHs), pesticides, ammonia, and free cyanide), conventional water chemistry parameters (dissolved oxygen, pH, temperature, and anions), and bacteria (*E. coli*) were evaluated for compliance with Indiana's Water Quality Standards, 327 IAC Article 2.⁶

Lake assessments pursuant to Section 314 of the CWA were based on the Carlson's Trophic State Index.⁷ Declining or extirpated Cisco populations and the presence of exotic and potentially toxic blue-green algae species were also considered when evaluating lake water quality for aquatic life use. For drinking water reservoirs, taste and odor were also considered as potential indicators of water quality problems.

B. IDEM's Removal of Waterbody AUs and Impairments from the 303(d) List

States must provide support for the decision to no longer list waters.⁸ To facilitate EPA's review, States should highlight those segment/pollutant combinations that have been removed from their previous 303(d) lists and provide detailed rationales for each delisting. Upon request from EPA, States must demonstrate "good cause" for not including waters on the list.⁹ Good cause includes but

⁴ See Figure 6 in Appendix B, and Figure 1 in Appendix G of the 2020 Indiana IR.

⁵ With regards to IDEM's WQ assessments for metal toxicants, EPA is taking a partial disapproval action with respect to certain metals causes of impairment on Indiana's 2020 Section 303(d) lists. Refer to Sections III.D. ii and iii of Enclosure 1 for additional details.

⁶ See Tables 2 – 14, and Pages G-7 to G-48 in Appendix G of 2020 IR.

⁷ See Table 14 in Appendix G of 2020 IR.

⁸ See 40 C.F.R. § 130.7(b)(6); and Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act (EPA, July 29, 2005).

⁹ See 40 C.F.R. § 130.7(b)(6)(iv)

is not limited to: more recent or accurate data; more sophisticated water quality monitoring; flaws in the original analysis that led to listing of the water; or changes in conditions.

IDEM identified the following reasons for the waterbody AU and impairment delistings under the 2020 listing cycle:¹⁰

- a. New data indicates that applicable WQS are now being met and the waterbody AU under consideration is in full support of the assessment criteria.
- b. A TMDL has been completed, and the waterbody AU is expected to meet WQS after implementation of the TMDL (Category 4A).
- c. An error is discovered in the sampling, testing, or reporting of data that led to an inappropriate AU and/or impairment listing.

In its 2020 IR submittal, IDEM identified the waterbody AUs and impairments previously listed on Indiana's 303(d) list (Category 5) that are being delisted.¹¹ Table 2 of Enclosure 3, identifies waterbody AUs that no longer appear in Category 5 for any impairment under the corresponding 2020 cycle. Table 3 of Enclosure 3 identifies waterbody AUs that remain in Category 5 but for which certain impairments are being delisted under the corresponding 2020 cycle. In 2020, a total of 68 waterbody AUs with 78 impairments were entirely delisted from Category 5, and 43 impairments were delisted from waterbody AUs that remain listed in Category 5 for other impairments. EPA finds that IDEM's delistings identified in Tables 2 and 3 of Enclosure 3 are appropriate, given the associated delisting rationales, and that good cause has been demonstrated for not including these waterbody AU/impairment combinations.

1. Removal of Waterbody AUs and Metal Impairments (Added to the 2010 list by EPA) from the 303(d) List

EPA added waterbody AUs and associated metal pollutant causes of impairment to the State's 2010 list. EPA concurs with IDEM's removal of some of these waterbody AUs and associated metals from Indiana's 303(d) list in the 2020 cycle (see Table 4 of Enclosure 3) based on rationales provided below.

— Rationale for the removal of waterbody AUs listings for aluminum

IDEM's derived value for aluminum was developed in 2005 based on the procedures in Indiana's WQS for deriving values to implement Indiana's narrative criteria. When EPA acted on the State's 2010 303(d) list, EPA stated that "any criteria derived using these procedures are 'applicable water quality standards' for CWA purposes" as that term is defined in EPA's listing regulations at 130.7(b)(3).¹² Upon further review of Indiana's water quality standards, EPA now finds that this statement was overly broad to the extent that it expressed that the State was required to use the procedures in Indiana's water quality standards to calculate derived values in all cases. Indiana's Administrative Code states that derived values "*may* be calculated by the commissioner using the corresponding procedures [emphasis added]" prescribed in the State's water quality standards.¹³ However, the State's standards do not say that these procedures "must"

¹⁰ See Tables 2 - 4 under Section 2 of Enclosure 3 for individual delisting rationales.

¹¹ See Appendix L of the 2020 Indiana IR; and Delisting Rationales provided under ATTAINS electronic submission. See also supplemental info provided in emails to Vilma Rivera-Carrero from Jody Arthur.

¹² EPA's Decision Document for the Indiana's 2010 303d List dated 5/8/2013 [p.10-11].

¹³ 327 IAC 2-1-6(a)(2)(C)

be used for assessment purposes. Accordingly, EPA finds that the derived values are merely a permissible means of implementing the state's water quality standards and it is reasonable for the State to decline to use the derived value procedures to calculate a specific numeric value where current science does not support the use of such procedures, and use a different approach for interpreting the narrative provided the approach used generates a value that is protective of the uses of the water.

IDEM has concluded that the derived value for aluminum is no longer scientifically valid in light of EPA's 2018 304(a) criteria recommendations for aluminum published. EPA's 2018 304(a) recommendations for aluminum rely on multiple linear regressions modeling to account for the effect of hardness, pH, and dissolved organic carbon (DOC) on bioavailability and toxicity to aquatic organisms. Since the underlying assumptions for the State's criteria derivation procedures are inconsistent with EPA's 2018 developed 304(a) recommendations for aluminum, EPA finds that IDEM has adequately substantiated its decision to no longer use the 2005 derived value for aluminum.

Rather than apply the derived value for aluminum, IDEM has instead opted to apply the scientifically robust EPA 2018 304(a) criterion recommendations as the new basis to assess whether the readily available aluminum data demonstrate attainment of the State's narrative criterion. The State has explained that it lacks robust DOC monitoring data, which is an essential factor of EPA's 304(a) criterion recommendation for aluminum. Therefore, EPA finds that IDEM has adequately substantiated that it is unable to use a scientifically supported means to assess waterbody AUs for aluminum attainment and the basis for EPA's identification of aluminum impairments in the 2010 303(d) is no longer valid. Accordingly, EPA is approving IDEM's decision not to include those impairments on the 2020 303(d) list.

EPA will continue to work with IDEM with its efforts to assess attainment of its narrative criteria to prevent toxic conditions to aquatic life with regards to aluminum concentrations.

— Rationale for the removal of waterbody AUs listings for certain metals (based on dissolved metal criteria assessments)

EPA's assessment of the attainment of dissolved metals criteria, based on a new method of translating metals total to dissolved¹⁴, has resulted in waterbody AUs no longer identified as impaired for certain metals (i.e. copper, lead and zinc).

— Rationale for the removal of waterbody AUs listings for certain metals (based on derived metal values assessments)

EPA's assessment of the attainment of derived metal values based on new data indicates that applicable WQS are now being met and the waterbody AU under consideration is in full support of the assessment criteria.

The removals identified in Table 4 of Enclosure 3 include 295 metal impairments to 277 waterbody AUs that remain listed in Category 5 for other impairments (**shown in bold font**), and 97 waterbody AUs with 99 metal impairments no longer listed in Category 5 (shown in regular font). EPA considers that these removals are appropriate given the associated rationales, and that good cause has been demonstrated for not including these waterbody AU/impairment combinations.

¹⁴ Refer to Item 3 under Section III. D. ii of Enclosure 1 for additional details.

C. IDEM's Waterbody AUs and Impairments Added to the 303(d) list

The State has added certain waters to its 2020 Section 303(d) list.¹⁵ As provided in 40 C.F.R. § 130.7(b)(4), for each WQLS, states are required to identify the “pollutants causing or expected to cause violations of the applicable water quality standards.” Based on new data/ information showing waterbody AUs are impaired for one or more parameters, IDEM has added waterbody AUs to the 2020 Section 303(d) lists (Category 5). Table 5 of Enclosure 3 identifies new waterbody AUs added to Category 5. Table 6 of Enclosure 3 identifies new impairments added to waterbody AUs previously listed in Category 5. Table 8 of Enclosure 3 also identifies new impairments added to waterbody AUs previously listed in Category 5, with the distinction that these waterbody AUs have been resegmented. In 2020, a total of 31 waterbody AUs with 38 impairments were newly listed in Category 5, and 29 impairments were added to waterbody AUs previously listed in Category 5. EPA considers that IDEM's additions, identified in Tables 5, 6 and 8 of Enclosure 3 are appropriate.

D. IDEM's Waterbody AU Segmentation Changes

IDEM developed a high-resolution indexing process to identify more representative stream reaches for assessment purposes. IDEM's high resolution indexing process defines new AUs based on small catchment basins (very small watersheds) and then adds the new streams that appear on the map at the 1:24,000 scale NHD to these new AUs. This process leads to grouping tributary streams into smaller catchment basins of similar hydrology, land use, and other characteristics such that all tributaries within the catchment basin can be expected to have similar potential impacts. All tributaries within a catchment basin are assigned a single AUID.

High resolution indexing using the catchment basin approach is guided by the hydrology of a system, the land uses within a watershed, the presence and location of any permitted facilities, and any other known factors that might reasonably be expected to impact hydrology, water quality, or both (e.g. dams, channelization, wetlands). Also, as part of this high-resolution indexing/catchment basin process, IDEM conducts a reassessment of each AU indexed to evaluate any existing information for all designated uses assessed to ensure that no valuable information is lost, and that assessment information is appropriately applied to the new AU. Once resegmentation is completed, the AU IDs of all the original waterbody AUs are retired.

Table 7 and Table 8 of Enclosure 3 identify all of the waterbody AUs and impairments that resulted from changes in segmentation during the corresponding 2020 cycle.¹⁶

¹⁵ See Appendix L of the 2020 Indiana IR; and Additions identified under ATTAINS electronic submission.

¹⁶ The waterbody AUs and impairments listed in Table 7 were not included in the calculations of the number counts reported for “newly added waterbody AUs” and “newly added impairments” to Category 5. These waterbody AUs and impairments are a product of the resegmentations of previously listed waterbody AUs and therefore are not considered to be true additions. The impairments listed in Table 8 were included in the calculations of the number counts reported for “newly added impairments” to Category 5. These impairments were not formerly listed under the previously listed waterbody AUs that were resegmented. Therefore, these impairments are considered to be true additions. See Appendix L of the 2020 Indiana IR; and AU info identified under ATTAINS electronic submission.

E. IDEM's Waters Subject to Other Pollution Control Requirements Stringent Enough to Implement any Water Quality Standards, 40 C.F.R. § 130.7(b)(1)(iii) Category 4B

Under 40 C.F.R. § 130.7(b)(1), states are not required to list WQLS still requiring TMDLs where effluent limitations required by the CWA, more stringent effluent limitations required by state or local authority, or other pollution control requirements required by state, local, or federal authority are stringent enough to implement applicable water quality standards. The regulation does not specify the time frame in which these various requirements must meet applicable water quality standards to support a state's decision not to list particular waters.

In keeping with the IR approach as provided by the 2006 IR Guidance, and subsequent IR Memoranda, the State placed waters in Category 4B where other required control measures are expected to result in the attainment of an applicable water quality standard in a reasonable period of time. Indiana listed 9 waterbody AUs and 13 impairments in Category 4B (Table 9 of Enclosure 3).¹⁷ Technically, no waterbodies and impairments were removed nor added to Category 4B during the 2020 listing cycle. However, there were some revisions made to the previously identified waterbody AU IDs due to resegmentations reflecting IDEM's Reach Index.

IDEM determined that the water quality concerns listed for these segments were due solely to point sources. All of the waterbody AUs identified in Category 4B have some type of enforceable mechanism that will result in attainment of water quality standards for these seven waterbody AUs within a reasonable time, and EPA continues to agree these designations are appropriate.

The impairments to the Wabash River and Turtle Creek Reservoir waterbody AUs were attributed to three electric generating facilities discharging to these waters. The facilities in question have NPDES permits for thermal discharge limits based on site-specific standards and have contested IDEM's claims of permit violations based on annual reports which indicated no detrimental effects from their discharges. IDEM determined that an additional study was needed to determine whether the monitoring and reporting requirements under Section 316(a) of the Act, 33 U.S.C. § 1326, were sufficient to ensure the protection of aquatic life in the waters outside of the mixing zone. In December 2005, the U.S. Fish and Wildlife Service, through an Interagency Agreement with IDEM, completed a report entitled, *Evaluation and Assessment of Fish Assemblages Near Electric Generating Facilities: with Emphasis on Review of Discharge Submitted Data, Development of the Standard Operation Procedures, and Traveling Zone Assessment* (Simon, 2005). The objectives of this study were to evaluate the information submitted by the industry for compliance with Section 316(a) requirements; to develop standard methods that would provide industrial contractors specific protocols for use in meeting permit monitoring requirements for their heated effluents; and to conduct traveling zone studies of discharge relationships from selected thermal generating facilities, including two of the three facilities to which the above impairments were attributed. Following completion of the study, IDEM reviewed the results and determined that additional monitoring and reporting requirements are necessary under Section 316(a) to ensure a well- balanced aquatic community in waters outside the mixing zone. In 2006 and 2007, IDEM renewed permits for most electric generating facilities in the State, which included requirements for permittees to submit new Section 316(a) demonstration/variance requests with their NPDES renewal applications. In order to be granted a Section 316(a) variance, these facilities must include a site-specific biological study plan in

¹⁷ See Tables 2 and 3 in Appendix D of the 2020 Indiana IR; and Category 4B identified under ATTAINS electronic submission.

their request which demonstrates that the variance will not result in biological impairment outside the mixing zone.

IDEM developed a guidance for permittees requesting a 316(a) thermal limits variance in their NPDES permit: “*Guidance for Conducting a Demonstration as a Requirement of a 316(a) Alternative Thermal Effluent Limitation Request*”. This document contains the guidance necessary for completing an application for alternative thermal effluent limitations, a Type I, II, or III Demonstration, and sampling and monitoring consistent with associated standard operating procedures. A demonstration for alternative thermal effluent limitations, in accordance with section 316(a) of the CWA and 327 IAC 5-7, should provide IDEM with adequate information to establish alternative thermal effluent limitations that will ensure the protection and propagation of a Balanced, Indigenous Community (BIC) in and on the waters into which a thermal discharge is made. IDEM’s guidance document is currently under internal (IDEM/U.S. EPA) review. In the meantime, until IDEM begins full implementation of its approach to issuing 316(a) thermal variances, when NPDES permits with existing 316(a) thermal variances come up for renewal, IDEM is adding year-round alternative thermal limits (if they do not already exist) to the permit until a complete revised 316(a) application can be submitted and evaluated.

The impairments to the Turkey Fork waterbody AUs were attributed to the Picnic Wood Wastewater Treatment Plant, owned by LMH Utilities Corporation, and are presently being addressed through IDEM’s NPDES program. LMH Utilities Corporation completed upgrades to its treatment facility in 2007. The plant continues to have sporadic compliance issues including effluent violations for ammonia in 2015 and a sanitary sewer overflow at the main lift station in 2018 as well as ongoing operational issues. These impairments will remain in Category 4B through the 2020 cycle to allow time for IDEM to conduct the follow-up monitoring necessary to determine if the current biological condition of these waters.

These waters will continue to be monitored, through IDEM’s rotating basin monitoring schedule, in order to verify that the water quality standards are attained as expected in a reasonable time frame. In subsequent list submissions, EPA may determine that a segment included in Category 4B should be returned to Category 5 if circumstances have changed such that the State can no longer support its original 4B demonstration, and water quality standards will not be attained in a reasonable time through implementation of the requirements listed in 40 C.F.R. § 130.7(b)(1). Alternatively, if the State later determines that these Category 4B waters are meeting applicable standards when the next Section 303(d) list is developed, it would be appropriate for the State to remove the waters from the Category 4B list at that time and place them into Category 1 or Category 2 as appropriate.

F. IDEM’s Waters listed on Category 4C of the Integrated Report (Pollution not Pollutant)

In keeping with the IR approach as provided by the 2006 IR Guidance, and subsequent IR Memoranda, waterbody segments that were identified in the listing cycle as being impaired due to non-pollutant stressors are listed in Category 4C of the IR. Indiana listed 33 waterbody AUs and 35 impairments in Category 4C ([Table 10 of Enclosure 3](#)).¹⁸ Technically, no waterbodies and impairments were removed nor added to Category 4C during the 2020 listing cycle. However, there

¹⁸ See [Table 4 in Appendix D](#) of the 2020 Indiana IR; and Category 4C identified under ATTAINS electronic submission.

were some revisions made to the previously identified waterbody AU IDs due to resegmentations reflecting IDEM's Reach Index.

The waters identified in Category 4C have a low Index of Biological Integrity (IBI) score which indicates poor biology. However, IDEM has sampled the same locations for chemistry data and has found no violations of the applicable water quality standards. Thus, habitat is impaired, but it is not caused by a pollutant. The pollution sources for these waters fall into the following categories:

- a) Channelization, which refers to the straightening of a channel and/or destruction of instream habitat. This source is typically attributed to waters with impaired biotic communities where the chemical data reveals no pollutant loadings that are driving the impairment, and the primary source of the impairment is straightening of the channel and/or the destruction of instream habitat. This source may or may not be associated with continual drain maintenance and is determined on a case-by-case basis at the time assessments are made.
- b) Habitat Modification, which refers to destruction or removal of instream habitat (loss of riparian habitat) due to activities other than hydromodification. This source is analogous to hydromodification in that it is typically attributed to waters with impaired biotic communities where the chemical data reveal no pollutant loadings that are driving the impairment, and the primary source of the impairment is the destruction of instream habitat. This source is commonly associated with continual drain maintenance.
- c) Natural Sources, which refers to naturally intermittent streams with flow regimes such that they cannot achieve oxygenation sufficient to meet Indiana's water quality standards for dissolved oxygen or sustain a healthy aquatic community. This source is typically associated with low dissolved oxygen impairments or impaired biotic communities.

The waters in Category 4C will remain candidates for future monitoring through IDEM's rotating basin monitoring schedule.