

## TITLE 327 WATER POLLUTION CONTROL BOARD

### LSA Document #14-58

#### SUMMARY/RESPONSE TO COMMENTS RECEIVED AT THE FIRST PUBLIC HEARING

On November 18, 2020, the Environmental Rules Board (board) conducted the first public hearing/board meeting concerning the development of amendments to 327 IAC 2-1-6 and 327 IAC 2-1.5-8 concerning revisions to Indiana's aquatic life and human health surface water quality criteria (WQC) for select metals to reflect updates based on current science and National Recommended Water Quality Criteria (NRWQC) at Section 304(a) of the Clean Water Act (CWA). Comments were made by the following parties:

Honda Manufacturing of Indiana (HMIN)

Indiana Coal Council (ICC)

Indiana Manufacturers Association (IMA)

Indianapolis Power and Light, an AES Company (IPL)

Following is a summary of the comments received and IDEM's responses thereto:

#### **Support for the rulemaking**

*Comment:* Honda Manufacturing of Indiana (HMIN) has been located in Greensburg, Indiana, since 2008, employs over 2,500 associates, represents a \$1.1 billion capital investment in Indiana, and, in addition to the direct employment, is home to 51 suppliers that support the HMIN efforts. HMIN recognizes that the draft rule revises aquatic life and human health ambient water quality criteria (WQC) for metals to reflect updates to the National Recommended Water Quality Criteria (NRWQC) as required by Section 304(a) of the Clean Water Act (CWA) and current science. HMIN supports the rule revisions because environmental programs should be based on the best available science. HMIN urges the prompt approval and finalization of the rule so the updates can meaningfully benefit those regulated by metals WQC. (HMIN)

*Response:* IDEM appreciates the support for the rulemaking.

#### **Aluminum**

*Comment:* Indiana Coal Council (ICC) supports IDEM's intention not to adopt the 2018 NRWQC for aluminum at this time. IDEM should not adopt an aluminum WQC until the U.S. EPA's 2019 Draft Technical Support Document addresses all the concerns and comments raised regarding issues in need of guidance, including how states can address the significant fraction of nontoxic aluminum that is associated with clays and other sedimentary particles, which could have significant impact in Indiana where sedimentary geology and thick soils often lead to elevated ambient concentrations of suspended sediment in waterbodies. (ICC)

*Response:* IDEM appreciates the support for IDEM's decision regarding the adoption of aluminum criteria as part of this rulemaking. IDEM is aware of the concerns ICC and other stakeholders have raised regarding implementing the 2018 NRWQC for aluminum. U.S. EPA is finalizing guidance for implementing the 2018 NRWQC for aluminum. Additionally, IDEM understands that U.S. EPA is in the process of approving an analytical method for aluminum that utilizes a higher pH for acid extraction than the current method. IDEM intends to consider adopting the 2018 NRWQC for aluminum in a future rulemaking after these tools are available for stakeholders.

## Selenium

*Comment:* Selenium water quality data in Indiana is somewhat limited. IDEM has collected selenium in fish tissue as part of the statewide sampling and assessment program. Results of that sampling indicate that selenium concentrations in fish tissue rarely reach high enough levels to adversely impact the fish population. Of the 260 sites sampled, only 3 showed exceedances of the 2016 EPA criteria. The sample sites where these exceedances occurred were located at sites not affected by mining discharges. Similarly, of the 1,997 fish tissue samples collected, only 14 showed exceedances, which equates to a 99.3% compliance rate. This sampling demonstrates that selenium toxicity is not occurring on a widespread scale in Indiana. (ICC)

*Response:* IDEM conducted a similar evaluation of long-term monitoring data at fixed station and probabilistic monitoring sites and agrees that the monitoring data from fixed stations and probabilistic sites do not indicate that selenium in concentrations that exceed the draft rule selenium water column criterion elements is a widespread problem in Indiana surface waters. Some of the test methods for surface water in the legacy data, however, had method detection limits that exceed the proposed selenium water column criterion elements. IDEM also conducted an analysis of fish tissue sampling data and agrees that concentrations of selenium in fish tissue exceeding draft rule fish tissue criterion elements is not a widespread issue in Indiana surface water but instead has been associated with a limited number of cooling ponds for coal fired power plants and in a limited number of rivers and streams.

While IDEM's review of available data did not identify a widespread occurrence of selenium in Indiana's waters, IDEM believes it is important to have appropriate, science-based criteria adopted into Indiana's water quality standards to ensure protection of Indiana's aquatic life use.

Indiana's selenium surface water quality criteria for aquatic life for waters outside of the Great Lakes System (downstate) were adopted in 1990. Indiana's selenium aquatic life criteria for waters within the Great Lakes System were adopted in 1997. Indiana's current criteria do not reflect the current science for selenium toxicity and may not be protective of the aquatic life designated use.

As an example, elevated selenium concentrations in surface water resulted in adverse impacts to fish and aquatic dependent wildlife at the Cane Ridge Wildlife Management Area (WMA) at the Patoka Wildlife Refuge. This wildlife management area was constructed by Duke Energy adjacent to the Gibson Generating Station, a coal-burning, electricity-generating facility. The Cane Ridge WMA is part of a Globally Important Bird Area due to the presence of the largest nesting colony of federally endangered interior least terns (*Sternula antillarum*) east of the Mississippi River. The Gibson Generating Station cooling pond center dike had become the least tern's primary nesting area, but terns also nested on the ash ponds, dredge flats, landfill, and surrounding roads. In consultation with the U.S. Fish and Wildlife Service (USFWS), Duke Energy entered a Habitat Conservation Plan on July 2, 1999, to protect and manage interior least terns at the Gibson Generating Station.

Initially, water from the Gibson Generating Station cooling pond provided source water for Cane Ridge WMA, and this source water, which is impacted by coal combustion residuals at an average of 13 µg/L selenium in 2007, contributed to elevated levels of selenium that resulted in increasing levels of selenium in biota, including zooplankton, dragonflies, frogs, and fish. Over several years, selenium uptake and bioconcentration in the food web resulted in reduced hatch rates in fish. Reduced hatch rates and chick deaths in aquatic-dependent wildlife (least tern, red-winged blackbird, black-necked stilt) were observed.

Reported selenium detections in surface water at Cane Ridge WMA (11-14 µg/L) were

below Indiana's current downstate chronic selenium criterion (35 µg/L) but would exceed the proposed selenium lentic criterion element (1.5 µg/L). These detections would also exceed the site-specific lentic criterion recently proposed and adopted by Montana for Lake Koocanusa (0.8 µg/L), a reservoir straddling the U.S and Canadian border (State of Montana Newsroom, 2020).

In 2008, Duke and USFWS took extraordinary measures to remedy the situation at the Cane Ridge WMA, including draining the water from the management area, disking sediment to redistribute and bury the higher concentration of selenium in surficial sediment, and installing an alternate water supply for Cane Ridge WMA from the Wabash River. Each spring beginning in 2009, Duke Energy has stocked 60,000 ready-to-spawn Fathead minnows in the Cane Ridge WMA tern pool to provide a clean alternative food source for the least terns in hopes of attracting terns away from Threadfin shad in the Gibson Generating Station cooling pond because these shad have elevated levels of selenium in fish tissue. (Sparks, 2012; USFWS, 2012).

IDEM does not believe that adopting the 2016 NRWQC for selenium will have a widespread impact on the regulated community but will provide protection for aquatic life and aquatic-dependent wildlife where the potential to exceed these criteria exists.

*Comment:* U.S. EPA guidance generally suggests that state-specific criteria may be appropriate for waterbodies where background water quality is different from the laboratory water used and where the types of species in the region differ from those actually tested in developing the criteria. In addition to using fish species more representative of Indiana's waterbodies, for example, including available data for Fathead minnows, which are often a dominant species in Indiana streams but were not fully included in U.S. EPA's NRWQC development, the proposed criteria should also recognize that Indiana is dominated by sedimentary geology known to be natural sources of elevated selenium. In addition, it has been shown that sulfate at levels typical of Indiana waters can significantly lessen selenium toxicity in water columns. IDEM needs to recognize this when adopting state-specific standards for selenium. (IMA)

*Response:* IDEM will address each of the points in this comment separately.

- IDEM monitoring data from fixed stations and probabilistic sites do not indicate that selenium in concentrations exceeding the proposed rule selenium water column criterion elements is a widespread problem in Indiana surface waters such that statewide, site-specific, water column criterion elements are warranted.
- IDEM does not agree that the toxicity endpoints for the U.S. EPA Species Sensitivity Distribution (SSD) used to derive the 2016 NRWQC for selenium neglected to include data for Fathead minnows in the criterion calculations or that the 2016 NRWQC SSD lacks fish species representative of Indiana's water bodies.
  - Fathead minnow toxicity information is shown on Table 3.1 of, "Maternal Transfer Reproductive Studies," (U.S. EPA 2016 (a), p 45-46). The Fathead minnow estimated genus mean chronic value (< 25.6 mg/kg dw egg-ovary) ranks seventh of the nine egg-laying fish genera mean chronic values. Please consult U.S. EPA's methodology (Stephen et al, 1985) for more detail regarding the statistical procedure for calculating aquatic life criteria utilizing the SSD GMCVs.
  - White sturgeon (*Acipenser transmontanus*), representing the Family Acipenseridae, Order Acipenseriformes, is the aquatic organism most sensitive to the effects of selenium in the 2016 NRWQC SSD. While this species is not found in Indiana, it serves as a surrogate in Indiana for two sturgeon species (Lake sturgeon (*Acipenser fulvescens*) and Shovelnose sturgeon (*Scaphirhynchus platorynchus*)) and one paddlefish species (American paddlefish (*Polyodon spathula*)) in the Order Acipenseriformes (IDNR, 2012(a), 2012(b), 2019(a) and

2019(b)), which are not included in the SSD (U.S. EPA, 2013; see Appendix 1). Indiana species represented in the genus *Lepomis*, the second most sensitive species in the 2016 NRWQC for selenium, represented in the SSD by Bluegill sunfish (*Lepomis macrochirus*), which is widely distributed in Indiana, include other *Lepomis* species, such as Green sunfish, Orange spotted sunfish, Redear sunfish, and Warmouth. The remaining 2016 NRWQC SSD fish genera include many Indiana resident genera/species or stocked species, in addition to those reviewed previously: *Oncorhynchus* (Rainbow trout, Chinook salmon, and Coho salmon), *Salmo* (Brown trout), *Salvelinus* (Lake trout), *Micropterus* (Largemouth bass, Smallmouth bass, and Spotted bass), *Esox* (Northern pike, Muskellunge, Grass pickerel, and Tiger muskie) and *Pimephales* (Fathead minnow and numerous closely related minnow species in the family Cyprinidae) (IDNR, 2018).

- As noted in the previous comment and response, elevated concentrations of selenium over the criterion elements proposed in the draft rule are not a widespread issue in Indiana surface waters, based on a review of Indiana monitoring data at fixed stations and probabilistic sites. However, there are locations in Indiana where adverse impacts from selenium toxicity have been detected and observed. IDEM does not believe that adopting the 2016 NRWQC for selenium will have a widespread impact on the regulated community, but this criterion will provide protection for Indiana's aquatic life and aquatic-dependent wildlife where the potential to exceed these criteria exists.
- GEI noted high sulfate waters have the potential to reduce acute selenium toxicity and that the water column elements developed on a national scale may be overprotective of some Indiana waters that have high sulfate. However, the 2016 NRWQC does not include acute selenium criterion elements or define a relationship between selenium concentrations and sulfate. Adverse impacts of selenium occur at the chronic levels, which are at lower concentrations in the water column. U.S. EPA is not recommending a separate acute criterion derived from the results of toxicity tests having water-only exposure because selenium is bioaccumulative and toxicity primarily occurs through dietary exposure. (U.S. EPA 2016(a), p 100).

*Comment:* ICC believes there are many deficiencies with U.S. EPA's NRWQC for selenium, and, instead, supports the alternative proposal developed by GEI that was discussed in the ICC comments submitted on the draft rule during the Second Notice of Comment Period. IDEM's response to comments indicates that many of GEI's recommendations regarding interpretation of the underlying scientific studies of the NRWQC are not allowed in adoption of a site-specific or state-specific standard. Specifically, IDEM states that "While states and stakeholders can provide comments on the interpretation of toxicity studies and toxicological endpoints proposed during the comment period for draft NRWQC, U.S. EPA does not approve modification of toxicological endpoints (for example, species or genus mean acute or chronic values) in the species sensitivity distribution of a final NRWQC based on reinterpretation of studies used to derive the criteria." ICC is not aware of, and IDEM does not cite to, any federal regulation that prohibits reinterpretation of studies and endpoints used to derive the criteria, particularly where the NRWQC used interpretation methods that may not be appropriate for a state. (ICC)

*Response:* U.S. EPA publishes official guidance for implementing various programs authorized by the Clean Water Act. For example, U.S. EPA published procedures for deriving acute and chronic aquatic life criteria (Stephan et al, 1985) used to derive National Recommended Water Quality Criteria (NRWQC) for aquatic life.

U.S. EPA has published a series of guidance for modifying a NRWQC to consider state-specific and site-specific conditions. The most recent, *Revised Deletion Process for the Site-Specific Recalculation Procedure for Aquatic Life Criteria* (U.S. EPA, 2013) involves editing the composition of a SSD of tested species used to derive a site-specific aquatic life criterion in order to allow it to better reflect the taxonomy of species that reside at the site. The process does not include modifying individual Genus Mean Chronic Value (GMCV) toxicity endpoints in the NRWQC SSD for the species that will be retained in the SSD.

GEI's recommendations to modify several of U.S. EPA's toxicity endpoints, specifically the GMCVs for White sturgeon and Bluegill were also provided to U.S. EPA during the comment period for the draft NRWQC for selenium. U.S. EPA considered but did not agree with or incorporate GEI's recommendations for the final NRWQC for selenium (IDEM, 2020(a), pp 12-15).

GEI's recommended changes for the White sturgeon and Bluegill GMCV toxicity endpoints would result in a less protective criterion for the taxa these species represent in Indiana. These are the two most sensitive species in the SSD, and the GMCVs are directly included in the statistical calculations. GEI's proposed change to include Fathead minnow data does not impact the criterion calculation, as the Fathead minnow is already included in the SSD. Fathead minnows are ranked seventh in sensitivity of the nine egg-laying fish and 15 aquatic species in the NRWQC SSD, see Table 3.1, "Maternal Transfer Reproductive Studies," (U.S. EPA 2016(a), p 45-46).

In conclusion, these recommendations provided by GEI do not follow U.S. EPA's implementation guidance for deriving site specific criteria so are not defensible for developing a site-specific selenium criterion for Indiana.

*Comment:* ICC still does not support IDEM's adoption of the U.S. EPA NRWQC for waters with sturgeon or paddlefish. As was detailed in previous ICC comments, there are numerous issues with the U.S. EPA NRWQC that result in a water column concentration that is more stringent than necessary for protection of aquatic life. These included, but were not limited to, data usage decisions employed in derivation of the criteria that may not be appropriate for Indiana, criteria calculation methods that deviate from traditionally accepted methods, and scientific literature published since the NRWQC that emphasizes complexities regarding selenium uptake and interference from other pollutants that were not accounted for in the NRWQC. Again, ICC does not agree that states cannot consider these differences when developing state-specific standards. (ICC)

*Response:* The 2016 NRWQC for selenium represents the best available science at the time of its publication for the protection of aquatic life from the bioaccumulative properties of selenium in the aquatic environment. U.S. EPA evaluated GEI's comments in the development of the NRWQC. The 2016 NRWQC for selenium better protects aquatic life than Indiana's current selenium criteria, which do not consider its bioaccumulative properties. While scientific literature published since the NRWQC might emphasize complexities regarding selenium uptake and interference from other pollutants that were not accounted for in the NRWQC, it is not clear from this comment how these findings specifically apply to Indiana surface waters.

Regarding data usage, the toxicity studies included in the NRWQC SSD are representative of species in Indiana, as noted previously. It is important to acknowledge that the data usage decisions for the development of this criterion were necessarily unique, given the criterion, which unlike any other NRWQC, is based on egg-ovary fish tissue concentrations, and that selenium bioaccumulates and bioconcentrates in the aquatic food web. U.S. EPA applied trophic transfer factors to derive whole fish/fillet and water column toxicity endpoints from the egg-ovary fish tissue criterion element. IDEM does not agree that U.S. EPA deviated from its criterion calculation

methods for calculating criterion elements, which apply a statistical procedure (Stephan et al, 1985) to each set of genus-mean chronic values to calculate each of the criterion elements. This methodology is used to derive other NRWQC for aquatic life.

*Comment:* ICC is supportive, in concept, of IDEM's site-specific component for waters without sturgeon or paddlefish present for the following reasons. When U.S. EPA finalized the NRWQC, the derivation included a white sturgeon toxicity study. The white sturgeon is the most sensitive species in the U.S. EPA database with regard to selenium toxicity. Therefore, the inclusion of this study specifically has a significant impact in the resulting criteria concentrations. The U.S. EPA also admittedly diverged from its traditional data interpretation methods for the white sturgeon, which resulted in an overly conservative toxicity value for the white sturgeon and ultimately drove the criterion to significantly lower concentrations. Because the sturgeon has limited geographical presence and is typically restricted to larger mainstem rivers, IDEM has taken a sensible approach to bifurcate the standard into two, that which applies to waters with sturgeon or paddlefish and that which applies to waters without sturgeon or paddlefish. A similar approach was taken by Idaho and approved by U.S. EPA, where the NRWQC was implemented in waters with sturgeon and a recalculation was completed for waters without sturgeon. However, the aforementioned GEI report also proposed a non-sturgeon standard and contained water column and fish tissue elements that were less stringent than those currently proposed by IDEM. ICC again requests that IDEM utilize an approach consistent with the GEI report and reinterpret the underlying studies and endpoints of the NRWQC according to Indiana practice. (ICC, IMA)

*Response:* IDEM appreciates the support for the *Acipenseriformes*-absent selenium criterion. As stated previously, GEI's recommendations for modifying the toxicity endpoints are not defensible or acceptable (IDEM 2020(a), pp 12-15). As a result, Indiana's proposed rule *Acipenseriformes*-absent selenium fish tissue criterion elements are the same as those calculated by Idaho Department of Environmental Quality (IDEQ), since both IDEM and IDEQ applied the U.S. EPA Recalculation Procedure (2013) to the remaining toxicity endpoints in the 2016 NRWQC SSD to derive the fish tissue criterion elements. IDEQ did not propose water column criterion elements for their sturgeon-absent criterion; instead, these will be site-specific. IDEM applied GEI's recommended regression-based approach (DeForest et al, 2017) to derive the proposed rule *Acipenseriformes*-absent water column criterion elements.

*Comment:* The draft rule states that an application to IDEM must be submitted to request a determination on the presence or absence of the Order *Acipenseriformes* (sturgeon and paddlefish). The state must then make a tentative determination, publish the notice in the Indiana Register, submit the determination to U.S. EPA for approval, and then incorporate the modification into the standards during the next revision. This is an extremely lengthy process that will result in permit delays and expenditure of significant resources on behalf of both permittees and IDEM. For example, if a permittee were seeking an "absence" determination, the IDEM approval process would likely take a minimum of one year to account for the application development, IDEM review, written determination, public notice, and comment response. Receiving U.S. EPA's final approval would likely take another year. Lastly, incorporation into the standards during the next review process would likely take three to five years. In total, this is a minimum of 5 years to receive a determination that *Acipenseriformes* are not present, during which time the permittee will likely be required to comply with the more stringent U.S. EPA NRWQC. (ICC)

*Response:* It is IDEM's opinion that stakeholders will have more flexibility if they are given the opportunity to demonstrate, on a case-by-case basis, that the *Acipenseriformes*-absent site-specific criterion is appropriate for their individual site. A performance-based approach entails applying a fixed buffer around the large rivers and streams where adult *Acipenseriformes* occur to

protect upstream waters used for spawning and to protect downstream water quality, based on the Idaho site-specific criterion, which was approved by U.S. EPA in consultation with the U.S. Fish and Wildlife Service. Because *Acipenseriformes* are widespread in downstate waters, a performance-based approach will not be a useful tool for stakeholders. IDEM prepared a map that shows the distribution of *Acipenseriformes* (Sturgeon and Paddlefish) waters with a buffer at the hydrologic unit code (HUC) 8 watershed level. The map is available on IDEM's web site under the heading of "Active Projects" at:

<https://www.in.gov/idem/cleanwater/2329.htm>

IDEM disagrees that applying for an *Acipenseriformes*-absent determination is necessarily a lengthy process. Once IDEM makes a determination that *Acipenseriformes* are absent, IDEM will provide a minimum 30-day comment period. U.S. EPA has committed to approving WQS within 90 days. Once U.S. EPA has approved a site-specific *Acipenseriformes*-absent determination, IDEM can immediately apply the site-specific criterion. IDEM will not need to wait until the SSC is adopted into rule before implementing the SSC in a NPDES permit.

*Comment:* The draft rule's process for seeking an absence determination regarding Order *Acipenseriformes* does not explain how anti-backsliding policies would allow for permit limit relaxation based on the absence determination. There is no indication of what is being considered in this determination, and there is no clear process for a discharger to refute a determination. For example, if IDEM makes a tentative determination that *Acipenseriformes* are present, it is unclear whether a permittee must accept this determination or if there is a method to confirm or refute this determination. (ICC)

*Response:* The water quality standards in 327 IAC 2 specify the applicable water quality criteria and procedures to modify them, along with mixing zone policies. The application of the water quality criteria in NPDES permits is addressed in 327 IAC 5. The site-specific selenium criterion option is not unique in that the Article 5 regulations determine how the state anti-backsliding provisions would apply to the potential relaxation of a permit limit for selenium. The anti-backsliding provisions under 327 IAC 5-2-10(a)(11) would be applied on a permit-by-permit basis considering the backsliding options available for the relaxation of a limit based on a state water quality standard.

IDEM plans to publish distribution maps and references for sturgeon and paddlefish species in Indiana on IDEM's website, in addition to implementation guidance for collecting fish tissue and water column data for implementing the criterion, as part of a packet of implementation tools available for permittees. A permittee will have the option to refute that *Acipenseriformes* are present by consulting available resources and references or presenting site-specific information, or both, and including this information in an application for a site-specific determination. If IDEM disagrees with the permittee's conclusion and denies the application, this determination is an agency action that is subject to appeal under IC 4-21.5-3.

Entities also have the option to derive a site-specific water column criterion element utilizing the U.S. EPA-approved bioaccumulation factor approach (BAF) or the mechanistic modeling methodology provided in Appendix K and included in the rulemaking, in addition to or instead of, applying for the *Acipenseriformes*-absent designation.

*Comment:* U.S. EPA provided opportunities for states to take a more streamlined approach to incorporation of site-specific standards, such as the performance-based approach. The performance-based approach was originally outlined in the final rule *EPA Review and Approval of State and Tribal Water Quality Standards* (65 Federal Register 24641-24653) and referenced in both the NRWQC and the draft *Technical Support for Adopting and Implementing EPA's 2016 Selenium Criterion in Water Quality Standards* (EPA 820-F-16-010). This method of site-specific

standards adoption requires the state to outline the set of procedures to develop the site-specific standard. This procedure must ensure "repeatable predictable outcomes" that protect the designated use. Once the state adopts those procedures and U.S. EPA approves them, each resulting site-specific criteria does not need to be adopted or approved by U.S. EPA. Instead, the state only needs to maintain a list of the site-specific criteria on its website and available to the public. The performance-based approach would significantly streamline the process for developing and adopting site-specific standards and provide the needed regulatory certainty for permittees. (ICC).

*Response:* GEI recommended that IDEM develop a site-specific criterion for portions of the state where sturgeon do not occur. Removing the toxicity endpoint for White sturgeon (*Acipenser transmontanus*) from the NRWQC SSD and then recalculating the criterion elements results in less stringent fish tissue criterion elements.

U.S. EPA rescinded all four draft Technical Support Guidance for selenium, including the draft *Technical Support for Adopting and Implementing EPA's 2016 Selenium Criterion in Water Quality Standards* (EPA 820-F-16-010) in September 2019 and has not reissued them. U.S. EPA has published a draft technical support document to translate selenium tissue criterion elements into water column criterion elements for California's proposed selenium criterion (U.S. EPA, 2018).

IDEM considered adopting a performance-based approach for the Acipenseriformes-absent site-specific criterion for waters outside of the Great Lakes System ("Downstate"). Indiana Acipenseriformes species in Downstate waters include the state endangered Lake sturgeon (*Acipenser fulvescens*), American paddlefish (*Polyodon spathula*), and Shovelnose sturgeon (*Scaphirhynchus platorynchus*). While mature Acipenseriformes species reside in larger streams and rivers, they move upstream to smaller tributaries to spawn, and the early life stages develop in these tributaries. The Acipenseriformes taxonomic group includes an Indiana state-endangered species (Lake sturgeon). Two of the species occur in interstate waters (Shovelnose sturgeon and American paddlefish). U.S. EPA regulations at 40 CFR 131.10(b) provide that "in designating uses of a waterbody and the appropriate criteria for those uses, the state shall take into consideration the water quality standards of downstream waters and ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." (U.S. EPA, 2016(a), p 102).

For an appropriately protective performance-based approach for Acipenseriformes-absent waters, IDEM would have to include a buffer of upstream watersheds at a consistent hydrologic unit code (HUC) scale. The purpose of this buffer is to protect waters where these species spawn and juveniles mature and to protect downstream water quality. The State of Idaho was the first state to adopt the 2016 NRWQC. White sturgeon (*Acipenser transmontanus*), the species in the SSD that is most sensitive to the adverse impacts of selenium, is native to Idaho. Idaho's U.S. EPA-approved performance-based sturgeon-absent criterion includes a buffer at the HUC 8 scale to the larger rivers and streams where mature sturgeon occur. The rule includes a list of the watersheds where the site-specific criterion is applicable (IDEQ, 2018).

To evaluate the spatial extent of a U.S. EPA-approved list of Acipenseriformes-absent waters (which is needed for the performance-based approach that allows the preclusion of U.S. EPA review of each site-specific application), IDEM developed a map for Indiana that shows the distribution of sturgeon and paddlefish species including a buffer at the HUC 8 scale. The use of a HUC 8 scale buffer for a performance-based approach leaves very few waters presumed Acipenseriformes-absent. Therefore, requiring a site-specific analysis that will require agency review and approval by both IDEM and U.S. EPA provides more flexibility to stakeholders.



Distribution maps and a list of scientific references will be posted on the IDEM website under the Office of Water Quality, Water Quality Standards web page.

In conclusion, it is IDEM's opinion that stakeholders have more flexibility to demonstrate that the *Acipenseriformes*-absent site-specific criterion is appropriate for their individual site than providing a U.S. EPA-approved list of watersheds, per the performance-based approach, that would include a fixed buffer at the HUC 8 scale.

*Comment:* In the case of this rulemaking, IDEM could adopt a two-pronged performance-based approach to site-specific standards. For the site-specific standard that is already developed, IDEM would need to define the procedures for determining whether *Acipenseriformes* are present or absent for a given stream reach. For this process, IDEM can add a footnote to the standard for waters with *Acipenseriformes* absent that states:

"The procedure for determining presence or absence of *Acipenseriformes* and applicability of this criteria should be based on existing or site-specific fish population studies of receiving waters."

For waters where an alternative site-specific standard is being developed, IDEM needs to define the procedures for developing that standard. For example, IDEM can add a footnote to the standard for waters with *Acipenseriformes* present that states:

"Site-specific water column criteria elements will be derived using a performance-based approach from fish tissue values via either the mechanistic model or empirical bioaccumulation factor (BAF) method and associated procedures laid out in appendix K of Aquatic Life Ambient Water Quality Criterion for Selenium–Freshwater 2016."

Use of the performance-based approach ensures data-driven reproducible results that are protective of the instream beneficial uses. Furthermore, it will lessen the delay associated with administrative review of site-specific standards for selenium. (ICC)

*Response:* For the reasons stated in the response to the previous comment, IDEM does not propose to adopt a performance-based approach for the *Acipenseriformes*-absent criterion element.

The procedure for determining presence or absence of *Acipenseriformes* is not solely based on existing or site-specific fish population studies of receiving waters, but on the definition at 327 IAC 2-1-9(37) and 327 IAC 2-1.5-2(62) for "occur at the site" that reads as follows:

"Occur at the site" includes the species, genera, families, orders, classes, and phyla that:

- (A) are usually present at the site;
- (B) are present at the site only seasonally due to migration;
- (C) are present intermittently because they periodically return to or extend their ranges into the site;
- (D) were present at the site in the past, are not currently present at the site due to degraded conditions, and are expected to return to the site when conditions improve; or
- (E) are present in nearby bodies of water, are not currently present at the site due to degraded conditions, and are expected to be present at the site when conditions improve.

The taxa that occur at the site cannot be determined merely by sampling downstream and upstream of the site at one (1) point in time. The term does not include taxa that were once present at the site but cannot exist at the site now due to permanent physical alteration of the habitat at the site, for example, alterations resulting from dams.

Regarding the recommendation for the second footnote, the proposed rule includes a provision for applying either of the Appendix K procedures, the BAF or mechanistic modeling methodologies, to derive site-specific water column criterion elements as provided at 327 IAC 2-

1-6(a)(4)(C) for waters outside of the Great Lakes System and 327 IAC 2-1.5-8(b)(3)(C) for waters within the Great Lakes System. It is important to include the mechanistic modeling methodology as it can be used in fishless waters to derive a site-specific water column criterion element. If fish are present, either the BAF or mechanistic modeling can be used to derive a site-specific water column criterion element. While the inclusion of these procedures will preclude the need to conduct an Indiana rulemaking for each decision, U.S. EPA approval will still be required before a modified criterion can be used for Clean Water Act purposes. U.S. EPA approval for site-specific modifications to water quality criteria is also required under 327 IAC 2-1-8.9 and 327 IAC 2-1.5-16, even when using the recalculation procedure.

*Comment:* The term "steady-state" used in the tables for the chronic aquatic criterion for selenium is described as an aquatic system that is not experiencing any new or increasing inputs of selenium. In the mining industry, operations are continuously adding and removing stormwater driven outfalls as the mine advances and areas are reclaimed. IDEM's approach of applying a conservative water column-based limit effective immediately to a newly constructed outfall is not sensible when the fish tissue concentration, which takes precedent over the water column concentration, should be the determining factor for compliance. Other states that have adopted selenium criteria have taken different approaches to this issue. For example, as explained in previous ICC comments, West Virginia considers a non-steady-state condition to be any new discharge that changes the concentration of selenium in the stream. However, for new discharges that maintain the preexisting concentration, the stream is considered to retain the "steady-state" condition. The determination of steady state should be based on predicted change in selenium concentrations, rather than the mere presence of a new or increased discharge. (ICC)

*Response:* IDEM's draft implementation guidance (IDEM 2020(a)) includes a provision for considering site-specific factors, such as presented in these scenarios, when determining if a receiving stream is "steady state". However, for the mining-specific situation described, the intermittent criterion element would apply. The intermittent criterion element is calculated based on the background concentration of the receiving water and the number of times the facility discharges in a 30-day period with a concentration that exceeds the applicable water column criterion element. Because the discharge is intermittent and not continuous, a higher water column criterion element may be applicable, depending on the site. Kentucky and West Virginia adopted their respective fish-tissue based selenium criteria before U.S EPA published the 2016 NRWQC, and neither set of criteria includes an intermittent water column criterion element.

*Comment:* IDEM's application of the selenium water column value to fishless waters is not a practical approach. Water quality standards are intended to protect the designated use. If there are waters without fish, which is typically due to low or no-flow conditions, the water quality standard should be applied where the designated use of the stream actually exists, which for aquatic life use is where the fish and macroinvertebrates are present. This is a similar idea to application of water supply standards at the point of intake, rather than throughout a stream reach. Fishless waters are another issue that several states have been grappling with and have adjusted the language to accommodate more practical approaches. Idaho instituted a footnote for fishless waters that allows selenium concentrations in fish from the nearest downstream waters to be used to assess compliance. West Virginia requires that the fish tissue sampling location be as close as practical to the source of selenium but allows it to be downstream of the outfall at the point of fish presence. Kentucky uses an approach that allows fish from the nearest 500 meters downstream to be used to assess compliance. These approaches are sensible because, in the vast majority of cases, streams are fishless due to limited flow or habitat, which is independent of the selenium concentration. Indiana must take a similar approach, allowing dischargers to sample further downstream in

situations with fishless waters. This issue is especially important in Indiana, where there is a large number of streams with low-flow or no-flow conditions that prevent the persistence of fish in headwater reaches. Prohibiting the application of the fish tissue element of the standard on these streams is not a practical approach to regulation, particularly considering the large spatial extent of headwater streams in the state. The implementation guidance must address this issue with a more reasonable approach prior to finalization of the rule. (ICC)

*Response:* IDEM will address these comments separately.

- All Indiana surface waters are designated for the aquatic life use, and Indiana's aquatic life criteria apply to all surface waters, regardless of the complexity or lack of complexity of the aquatic life assemblage. While fish are the aquatic species most sensitive to the adverse impacts of selenium's bioaccumulative impacts, the selenium criterion was derived to protect the entire aquatic life assemblage, and the SSD includes fauna other than fish. While it is true that certain low flow and intermittent streams may not have sufficient flow to support an aquatic life assemblage that includes fish, it is also true that impaired water quality can adversely impact an aquatic life assemblage so that fish are not present.
- U.S. EPA recommends that, when states adopt the four-part criterion for selenium reflecting the 2016 NRWQC, states use the default monthly average exposure water column elements of the criterion when implementing the criterion under the National Pollutant Discharge Elimination System (NPDES) permits program and to assist with implementation of other Clean Water Act programs (U.S. EPA 2016(a)). If an entity believes that the default water column element is not appropriate for a waterbody, it can develop a site-specific water column element using the procedures provided in Appendix K, Translation of a Selenium Fish Tissue Criterion Element to a Site-Specific Water Column Value, in EPA's *Aquatic Life Ambient Water Quality Criterion for Selenium—Freshwater 2016*.

Consistent with the U.S. EPA recommendation, IDEM plans to issue NPDES permits with limits based on the water column criterion element and not require monitoring of fish tissue for compliance purposes. IDEM's draft implementation guidance (IDEM 2020(b)) does describe a procedure whereby fish tissue may be used for reasonable potential to exceed (RPE) determinations if specific requirements are met.

- For facilities with intermittent discharges, such as the mining-specific situation described, the intermittent criterion element would apply. The intermittent criterion element is calculated based on the background concentration of the receiving water and the number of times the facility discharges in a 30-day period with a concentration that exceeds the applicable water column criterion element. Because the discharge is intermittent and not continuous, a higher water column criterion element may be applicable, depending on the site. It is not necessary to collect fish tissue samples to develop the site-specific intermittent criterion element. However, the facility would have the option to develop a site-specific criterion element by collecting surface water and fish tissue samples, as described in Indiana's draft implementation guidance (IDEM 2020(a)) or using the mechanistic modeling methodology in Appendix K for fishless waters.
- IDEM's draft implementation guidance (IDEM 2020(b)) describes the procedures for collecting fish tissue and water column data for implementation of the selenium criterion, including reach and sub-reach distances for collection of fish tissue samples.

In lotic systems, the upper limit of the sample reach for fish collection should begin immediately below the effluent outfall. When collecting fish for RPE determinations, the sample distance is limited to the first sub-reach length, based on the drainage area of the lotic system

(Table 1). When collecting fish tissue for a site-specific BAF, if the target fish tissue samples are not collected in the first sub-reach, proceed to the next downstream sub-reach and continue sampling, up to the maximum sample reach length, only until the target fish tissue samples are collected.

Table 1. Maximum sampling reach and designated sub-reach lengths for collecting fish tissue samples for lotic waterbody categories

Waterbody Category	Drainage Area (mile <sup>2</sup> )	Maximum Sample Reach Length (meters)	Sub-reach Length (meters)
Headwater Stream	< 20 mile <sup>2</sup> wadeable	400	100
Wadeable Stream	>20 -1000 mile <sup>2</sup> ) wadeable	500	100
Large River	1000-2000 mile <sup>2</sup> not wadeable	1000	250
Great River	Drainage Area < 2000 mile <sup>2</sup> not wadeable	1000	250

*Comment:* IDEM modified the dilution calculation methods for selenium away from current reliance on the 7Q10, which is the seven-day average low flow that occurs every ten years. On smaller streams, the 7Q10 is typically zero, which negates the consideration of dilution in NPDES permits. IDEM has modified this to apply the 30Q10 for selenium, which is the thirty-day average low flow that occurs every ten years. While this is movement in the right direction, it continues to ignore the dilution that is available on smaller streams during the spring or following rain events. Basing the low flow determination on a ten-year recurrence interval essentially prohibits mixing and dilution on all ephemeral and intermittent streams and many of the smaller perennial streams. All of these types of streams have had a 30-day low flow or no-flow period at some point in the last ten years. Other states have taken more practical approaches to allow consideration of wet weather mixing following rain events on these smaller streams. For example, Illinois has instituted a provision that applies to discontinuous discharges that allows the agency to apply mixing based on the stream flow available in the receiving stream at the time of discharge. While ICC supports the change from the 7Q10 to the 30Q10, IDEM needs to consider additional methods of increasing flexibility for mixing on smaller streams, such as the allowance of wet-weather mixing. (ICC)

*Response:* Using the 7Q10 for the allowable mixing zone dilution is specified in rule in 327 IAC 5. Using the 7Q10 flow is not appropriate for implementing the selenium criterion, so IDEM included a requirement to use the 30Q10 instead of the 7Q10 in a footnote of each of the following proposed selenium criteria:

For downstate waters, the requirement at 327 IAC 2-1-6(a)(4)(A), footnote 5, and 327 IAC 2-1-6(a)(4)(B), footnote 6, states: **"Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data and for fishless waters. Water column values are based on dissolved total selenium in water and are derived from fish tissue values via bioaccumulation modeling. Instead of the requirements in 327 IAC 5-2-11.1(b)(2), the allowable mixing zone dilution will be determined by applying the guideline in 327 IAC 2-1-4 to the thirty (30) day, ten (10) year (Q<sub>30,10</sub>) low flow of the receiving stream for the chronic aquatic criterion (CAC) water column criterion element applicable to lotic aquatic systems, in the absence of site-specific mixing zone data."**

For waters within the Great Lakes System, the requirement at 327 IAC 2-1.5-8(b)(3)(B), footnote 5, states: **"Water column values are the applicable criterion element in the absence**

**of steady-state condition fish tissue data and for fishless waters. Water column values are based on dissolved total selenium in water and are derived from fish tissue values via bioaccumulation modeling. Instead of the requirement in 327 IAC 5-2-11.4(b)(3)(A)(i)(CC), the thirty (30) day, ten (10) year stream design flow (Q<sub>30,10</sub>) must be used for deriving TMDLs, WLAs in the absence of TMDLs, and preliminary WLAs for tributaries of the Great Lakes system that exhibit appreciable flows relative to their volumes for the criterion continuous concentration (CCC) water column criterion element applicable to lotic aquatic systems unless data exist to demonstrate that an alternate stream design flow is appropriate for stream-specific and pollutant-specific conditions."**

For intermittent or controlled discharges, the use of an alternate stream flow is allowed if the alternate stream flow will ensure compliance with water quality criteria (327 IAC 5-2-11.1(b)(7) and 327 IAC 5-2-11.4(b)(3)(A)(iii)).

Additional modifications to the procedures in the NPDES implementation rules at 327 IAC 5 to calculate the allowable mixing zone to address scenarios suggested in this comment is outside the scope of this rulemaking. IDEM will consider these suggestions for a future rule change.

*Comment:* The general process related to obtaining a site-specific water-quality criterion at 327 IAC 2-1-6(a)(4)(C) is an appropriate idea; however, instead of including in rule language the specific methods for obtaining the site-specific criteria, the methods to be used should be included in a guidance document with permit applicants having the ability to suggest other methods as well if they can show that those methods are appropriate. The methods provided in the proposed rule are listed in a draft U.S. EPA document from 2016. Applicants should not be limited to using only those methods. U.S. EPA may modify its draft 2016 guidance to allow other methods. IDEM may allow other methods in its own guidance that is being developed now. And, as science develops, applicants may be able to show that other methods are scientifically defensible allowing alternative ways to derive a site-specific criterion. Specifying only the two methods currently listed by U.S. EPA would prohibit facilities from using other methods without going through a rigorous and lengthy rulemaking process. This could result in a facility utilizing an outdated method that may not provide the facility the ability to utilize its fish tissue sampling results appropriately when developing site-specific criterion. Even worse, it could result in a facility having to default to the water column criteria for permitting purposes because the U.S. EPA-specified methods did not provide the full flexibility to use the fish tissue sampling results in a proper scientific manner. This, in turn, could result in the need for unnecessary actions, such as costly treatment. IPL requests that the proposed language of 327 IAC 2-1-6(a)(4)(C)(i) be revised as follows:

(C) Modification of the selenium water column criterion element must be achieved according to the following:

(i) Site-specific water column criterion elements must be derived using ~~empirical bioaccumulation factor (BAF) or mechanistic modeling method provided in Aquatic Life Ambient Water Quality Criterion for Selenium—Freshwater, EPA-822 R-16-006, Appendix K: Translation of a Selenium Fish Tissue Criterion Element to a Site-specific Water Column Value (June 2016)\*~~ **methods included in relevant guidance issued by U.S. EPA or IDEM or another method that IDEM determines is scientifically defensible.**

(IPL)

*Response:* IDEM does not agree that it is appropriate to remove the U.S. EPA pre-approved Appendix K methods for deriving site-specific criterion elements from the criterion footnote. U.S. EPA's Appendix K methods are pre-approved methodologies for deriving site-specific criterion water column criterion elements, including in fishless waters. IDEM did consider whether it would

be acceptable to add IPL's suggested language to 327 IAC 2-1-6(a)(4)(C)(i) to allow for approval of an alternate method. The statutory provision governing incorporation by reference in rule prevents IDEM from including a general reference to a future guidance document. In addition, state rule standards require clear, specific criteria by which proposed alternative methods could be evaluated by IDEM on a consistent basis. Based on discussions with the Indiana Attorney General's Office, it was determined that IPL's suggested language, as well as other language contemplated by IDEM to give consideration to IPL's request for alternate methodologies, was not specific enough to meet this requirement. If U.S. EPA does approve an alternative method in the future, IDEM will consider adopting it into rule.

*Comment:* The proposed requirement to obtain a site-specific modification for waters that do not contain sturgeon and paddlefish as included in 327 IAC 2-1-6(D)(ii)-(iv), is not necessary or appropriate. The water quality criteria for non-sturgeon and paddlefish waters are already included in Table 6-1(B). IPL believes that the only requirement necessary for a facility to be able to utilize such water quality criteria is to provide IDEM with the necessary information to demonstrate that sturgeon and paddlefish do not occur at the site, as included in 327 IAC 2-1-6(a)(4)(D)(i). If information is provided to IDEM to render a successful demonstration, IDEM can simply provide an approval to the facility such that the respective facility can then utilize the water quality criteria included in Table 6-1(B) without the need to obtain a site-specific modification to the criteria. This will allow facilities to be able to move forward with compliance based on criteria that are reflective of their sites' water conditions for non-sturgeon and paddlefish in a reasonable manner. They should not be delayed due to more rigorous and unnecessary actions, such as additional rulemaking, that could place the facility in jeopardy of having to comply with more stringent water quality criteria than necessary. (IPL)

*Response:* The location where a site-specific application for a water quality criterion is proposed is subject to U.S. EPA approval. As discussed in previous responses to similar comments, it is IDEM's opinion that stakeholders will have more flexibility to demonstrate that the *Acipenseriformes*-absent site-specific criterion is appropriate for their individual sites than by adopting a U.S. EPA-approved performance-based approach. However, U.S. EPA will have to approve each of these individual determinations. For a performance-based approach that would not require U.S. EPA approval of each individual determination, IDEM would need to apply a defined fixed buffer, at the HUC 8 scale, to the larger rivers and streams where mature *Acipenseriformes* are usually found. This buffer will protect downstream water quality and waters where *Acipenseriformes* spawn and juveniles mature.

*Comment:* Concerning rule language at 327 IAC 2-1-6(a)(4)(D) (page 13 of 46 of the draft rule), both item (ii) and item (iii) apply to situations where *Acipenseriformes* do not occur. ICC believes that item (ii) is intended to apply to where they do occur and item (iii) is to apply where they do not occur. (ICC)

*Response:* Items (ii) and (iii) outline the formal public notice process for the site-specific criterion determination and approval for the *Acipenseriformes*-absence determination. Item (ii) states that IDEM must publish on IDEM's website information that supports the preliminary determination that *Acipenseriformes* do not occur at the site. IDEM must provide notice of this posting and solicit comments. After the comment period required by item (ii)(BB), if the determination that *Acipenseriformes* do not occur at the site is confirmed, IDEM, according to item (iii), then publishes a notice in the Indiana Register for another comment period and submits the site-specific determination to U.S. EPA for approval.

## **Development of guidance**

*Comment:* IDEM must develop guidance regarding permit implementation, fish tissue sampling, target species, and fish analysis before this rule is brought to the Environmental Rules Board for final adoption. Implementation of the selenium criterion into permits will be particularly important to regulated industries. It is important to maintain flexibility that allows a discharger to use water column-based sampling due to its simplicity and reduced costs. However, in the event of an exceedance of a water column value, a discharger should be allowed to use fish tissue data to verify whether the water column exceedance has resulted in an actual impact to the aquatic community. Experiences from other states indicate that, often times, occasional exceedances of the water column criteria do not manifest into fish tissue concentrations above the criteria. In these cases, there should be no compliance or enforcement against a discharger. (ICC)

*Response:* IDEM has developed a draft implementation guidance document with feedback from key stakeholders and U.S. EPA. This guidance will be finalized after rule adoption, as provisions in the guidance must necessarily conform to the criteria in the final rule.

IDEM worked with U.S. EPA and researched other states' approaches to selenium criterion implementation. The draft guidance (IDEM 2020(b)) provides direction for collecting fish tissue and water column samples to investigate selenium in fish tissue and the water column and conduct a reasonable potential to exceed (RPE) determination or derive a site-specific water column criterion element using the bioaccumulation factor (BAF) approach, or both. BAFs are used to relate chemical concentrations in aquatic organisms to concentrations in the ambient media of aquatic ecosystems where both the organism and its food are exposed and the ratio does not change substantially over time. IDEM has posted this guidance on the IDEM website and is both soliciting feedback and clarifying the guidance based on the feedback already received.

Since the adverse impacts of selenium are the reproductive impacts and these occur during maternal transfer of selenium during egg development, the appropriate timing for fish tissue sampling and selection of species appropriate for Indiana is critical in assessing if adverse impacts have occurred. Any plan to sample fish or collect water column data, or both, to assess selenium impacts or to derive a site-specific water column criterion element must be pre-approved by IDEM.

Exceeding a selenium permit limit will not "trigger" a requirement to immediately sample fish tissue to verify whether the water column exceedance has resulted in an adverse impact to the aquatic community. This is not consistent with the 2016 NRWQC, which is a chronic criterion element, nor is it protective of the aquatic assemblage in the receiving water. Such an approach is not the scientifically appropriate methodology for assessing chronic selenium impacts.

If exceeding a newly established permit limit is a potential issue, a compliance schedule may be warranted for a permittee with an existing NPDES permit. IDEM's draft implementation guidance (IDEM 2020(b)) describes a procedure whereby fish tissue may be used for RPE determinations if specific requirements are met. In addition, the permittee will have the option to develop a site-specific water column criterion element using the bioaccumulation factor approach, or in fishless waters, the mechanistic modeling methodology provided in Appendix K. Other options, such as the use of the intermittent criterion or an alternate stream flow may be available. Finally, a water quality standards variance is another option that may be considered. The permittee could also address the underlying causes for the elevated concentrations of selenium in their effluent discharge.

*Comment:* In development of implementation guidance, IDEM needs to address two issues of concern in U.S. EPA's draft guidance, including the application of the selenium criterion on: (1) streams with no fish; and (2) new discharges. These issues are directly related to implementation of the criteria in NPDES permits and assessing streams for attainment of the criteria in the 303(d) process. (IMA)

*Response:* For streams with no fish, the applicable water column criterion element applies. This is stated in the draft rule at:

- 327 IAC 2-1-6(a)(4)(A), Table 6-1a, footnote 5, for waters outside of the Great Lakes System,
- 327 IAC 2-1-6(a)(4)(B), Table 6-1b, footnote 6, for waters within the Great Lakes System where Acipenseriformes (sturgeon and paddlefish) are absent, and
- 327 IAC 2-1.5-8(b)(3)(B), Table 8-1a, footnote 5, for waters within the Great Lakes System.

For new discharges, IDEM's draft implementation guidance provides the following regarding the application of the selenium criterion:

"For new selenium inputs, selenium in fish tissue must be allowed to come into equilibrium with the water column before fish tissue concentration criterion elements would supersede water column concentration criterion elements (U.S. EPA 2016). When selenium inputs change, causing the concentration in the water column to increase or decrease, the fish tissue will not immediately reflect the change in water chemistry. U.S. EPA estimates that the concentration of selenium in fish tissue will not reach steady state for several months in lotic systems and longer time periods (e.g., as long as 2 to 3 years) in lentic systems. Generally, when any major changes to water column selenium concentrations occur and for new discharges, IDEM will require a minimum duration of 12 months before fish tissue may be sampled to assess bioaccumulation in the resident fish population. IDEM will consider site-specific factors that could shorten or lengthen this estimated time frame (IDEM 2020(b), pp 2-3)."

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