

REMOVAL TARGETS FOR BENEFICIAL USE IMPAIRMENTS APPLICABLE TO THE GRAND CALUMET RIVER AREA OF CONCERN

1. Restrictions on Fish and Wildlife Consumption

This Beneficial Use Impairment (BUI) can be considered for removal when:

- Bioaccumulative chemicals of concern (BCCs) (including PCBs, mercury, dioxins, and furans) within the Area of Concern (AOC) have been controlled through issuance of the appropriate regulatory control document or eliminated; and
- Indiana Fish consumption advisories for the AOC, attributable to conditions within the AOC, fall within Group 1 or Group 2 for two consecutive sampling cycles; and
- Waters within the Grand Calumet River AOC are not listed as impaired due to fish consumption advisories and/or contaminant levels in fish tissue in the most recent Indiana Integrated Water Monitoring and Assessment Report (submitted to U.S. EPA every two years) and/or the most recent Indiana Fish Consumption Advisory;

Or if the above is not achievable within 5 years:

- BCCs (including PCBs, mercury, dioxins, and furans) within the AOC have been controlled or eliminated; and
- A multi-year comparison study of fish tissue contaminant levels demonstrates that there is no statistically significant difference (with a 95% confidence interval) in fish tissue BCC concentrations in the AOC compared to fish tissue BCC concentrations in a representative non-impacted control site within the Lake Michigan Basin.

Current Status: Impaired



2. Tainting of Fish and Wildlife Flavor

This BUI can be considered for removal when:

- All known sources of materials that could result in tainting of fish and/or wildlife within the AOC have been controlled through issuance of the appropriate regulatory control document or eliminated; and
- Tissue analysis over two consecutive monitoring cycles shows that there are no chemicals present at concentrations that would result in tainting of the fish/wildlife flavor.

Current Status: Impaired



3. Degradation of Fish and Wildlife Populations

State of Indiana Removal Target for Fish:

- Meet ecoregion or applicable biological criteria (IBI and MIwb) for AOC Grand Calumet River and other appropriate habitat types (i.e., lagoon, dune and swale, wetland, pond, or lake designations); and meet biological indices guidelines for riverine, vernal pond, palustrine, or lacustrine wetland; and nearshore reaches of Lake Michigan; and
- Where applicable, sediment-associated contaminants are not at levels that inhibit normal benthic organism growth as determined by the removal target for degradation of benthos.

For Wildlife:

- Healthy, reproducing populations of appropriate sentinel species are present; and
- Where applicable, sediment-associated contaminants are not at levels that inhibit normal benthic organism growth as determined by the removal target for degradation of benthos.

Current Status: Impaired



4. Fish Tumors and Deformities

This BUI can be considered for removal when:

- All known sources of contaminants that are known causes of Deformities, Eroded Fins, Lesions, and Tumors (DELT) anomalies have been controlled in the AOC through issuance of the appropriate regulatory control; and
- There have been no exceedance of reports greater than 1.3% of external Deformities, Eroded Fins, Lesions, and Tumors (DELT) anomalies or internal organ/system impacts due to chemical contaminants that have been verified through observation and analysis by the IDEM/IDNR for an appropriate recent sampling period.
- Once levels of 1.3% or less of reported DELTs are met, reproductive health should be assessed.

OR, in cases where reports greater than 1.3% of DELT anomalies have been reported:

- A comparison study of resident benthic fish of comparable age and at maturity, or of fish species which have historically been associated with this BUI, in the AOC and a control site that showcases existing condition in the surrounding areas of Northwest Indiana indicates that there is no statistically significant difference (with a 95% confidence interval) in the incidence of liver tumors or deformities; and
- A comparison study of resident non-benthic fish of comparable age and at maturity in the AOC and a control site that showcases existing conditions in the surrounding areas of Northwest Indiana indicates that there is no statistically significant difference (with a 95% confidence interval) in the incidence of contaminant related external DELTs.

Current Status: Impaired



5. Bird or Animal Deformities or Reproduction Problems

This BUI can be considered for removal when:

Tissue Contaminant Levels as an Indicator of Deformities or Reproductive Problems

- Tissue concentrations of Bioaccumulative chemicals of concern (BCCs) in the AOC are at or lower than the LOEL known to cause reproductive or developmental problems in fish-eating birds and mammals, **or**
- Tissue concentrations of BCCs in the AOC are not statistically different than the associated Great Lake (at 95% confidence interval).

Animals of a size and species to be prey for the wildlife species under consideration must be used for the tissue data.

Current Status: Impaired



6. Degradation of Benthos

This BUI can be considered for removal when:

- All remedial/restoration actions for specific impacted benthic communities are completed (except for minor repairs required during operations and maintenance) and monitored according to the approved plan(s); and
- Known contaminant sources within the AOC contributing to sediment contamination and degraded benthos have been identified and control measures implemented; and
- The macroinvertebrate Index of Biotic Integrity (mIBI) at all sampling sites is a minimum of 3 for samples collected following acceptable state protocols.; and
- Acute sediment toxicity survival is at least 80% of toxicity test controls at all sampling locations; and
- Chronic sediment toxicity survival is at least 80% of toxicity test controls at all sampling locations.

Current Status: Impaired



7. Restrictions on Dredging Activities

This BUI may be considered for removal when the following actions have been taken to mitigate factors that may limit routine maintenance dredging of the Congressionally-authorized navigation channel of the Indiana Harbor and Indiana Harbor Ship Canal (IHSC):

- 1) sediments with an as-found total polychlorinated biphenyl (PCB) concentration of greater than or equal to 50 parts per million have been removed from, or isolated within, the federal channel to below the authorized channel depths; and,
- 2) contaminated sediments within the following areas adjacent to the Congressionally-authorized navigation channel have been removed, stabilized, or contained to prevent recontamination of the channel:
 - the “Orphan Areas” adjacent to Reaches 8 and 9 of the IHSC;
 - the portions of the Indiana Harbor south of Columbus Drive;
 - portions of the Lake George Branch of the IHSC east of the BP land bridge;

- the former Energy Cooperative Incorporated (ECI) South Tank Farm and West Tank Farm sites; and,
- areas of the Indiana Harbor adjacent to the former LTV and Inland Steel facilities.

Current Status: Impaired



8. Eutrophication or Undesirable Algae

This BUI can be considered for removal when:

- Outreach activities specifically designed to reduce nonpoint source and stormwater contributions of nutrients to AOC waters have been conducted within all four AOC communities;
- Biological controls on nutrients or excess algal growth have been implemented; and,
- All contaminated sediment management projects listed in the approved Sediment Management Action letter have been completed or planned.

Current Status: Impaired



9. Restrictions on Drinking Water Consumption, or Taste and Odor

This BUI can be considered for removal when:

- A reevaluation of this BUI indicates that the initial basis for listing the BU as impaired was in error; **or**
- There are no complaints of taste and/or odor in the raw water intake source as a result of contaminants originating within the AOC for a period of three consecutive years; and
- There are no taste and/or odor problems associated with raw water intakes as a result of excessive algae and/or algal species that would cause taste and/or odor problems in the water; and
- There is no additional raw water treatment that needs to be supplied specifically for control of taste and/or odor problems in the finished water supply.

Current Status: Restored (2012).



See IDEM [removal documentation](#) and U.S. EPA [approval letter](#).

10. Beach Closures

This BUI can be considered for removal when:

- Each individual beach along the Lake Michigan Shoreline in the AOC must have a percent exceedance rate of no higher than 15% for the *E. coli* samples taken from Memorial Day to Labor Day for three years out of a five year period. Where an exceedance is defined as any sample that exceeds the single sample maximum water quality standard for *E. coli* of 235 CFU/100 ml; or
- Percent exceedance rates at AOC beaches will be compared to percent exceedance rates for comparable Lake Michigan beaches located outside of the AOC to determine if there is a significant difference for three years out of a five year period, and if none occurs then the Beach Closure BUI may be suggested for removal. Where a significant difference is defined as no greater than a 1% variance between an individual AOC beach and an individual comparable non-AOC beach in each of the three years relied upon for suggesting BUI removal.

Note: Contamination that leads to exceedances within the AOC may also be attributable to sources outside the AOC.

Current Status: Impaired



11. Degradation of Aesthetics

State of Indiana Removal Target

- The general surface water quality shall meet the criteria outlined in 327 IAC 2-1.5-8 to the extent practical and possible.

This section is summarized as:

- Free from substances, materials, floating debris, oil, or scum attributable to municipal, industrial, agricultural, and other land use practices, or other discharges:
 - that will settle to form putrescent or otherwise objectionable deposits;
 - that are in amounts sufficient to be unsightly or deleterious;
 - that produce color, visible oil sheen, odor, or other conditions in such a degree as to create a nuisance;
 - that are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae in such a degree as to create a nuisance, be unsightly, or otherwise impair the designated uses; that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone;
 - that are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans.

Current Status: Impaired



12. Added Costs to Agriculture and Industry

This BUI can be considered for removal when:

- There is no increased cost of shipping due to the inability to dredge in the harbor and shipping canal for environmental reasons.

Current Status: Restored (2011).



See IDEM [removal documentation](#) and U.S. EPA [approval letter](#).

13. Degradation of Phytoplankton and Zooplankton Populations

Due to its linkages with both eutrophication and sediment contamination, this BUI can be considered for removal when the *Eutrophication or Undesirable Algae* Beneficial Use Impairment has been removed (restored).

Current Status: Impaired



14. Loss of Fish and Wildlife Habitat

This BUI may be considered for removal when the following targets are met for wildlife and fish habitat, respectively:

State of Indiana Removal Target Wildlife Habitat:

- Site conservation plans have been devised relating to the following habitat complexes listed within the [2014 Grand Calumet River Area of Concern Habitat Restoration Summary Report](#), where restoration was considered feasible by IDEM and the CARE Committee as of April 15, 2015:
 - DuPont/Tolleston Woods/Gibson Woods Complex, excepting USS Lead
 - Ivanhoe Complex
 - Clark & Pine/Pine Station Complex
 - Roxana Marsh Reach
 - BP Wetlands/Lake Mary
 - Lake George
- Key state and local land managers have agreements for long-term management at the aforementioned properties; and
- Assessment units within the aforementioned properties have met the following habitat quality metrics, based on two consecutive assessments, unless specifically exempted by the appropriate site conservation plan:
 - **Remnant or Constructed Upland Assessment Units:**
 - All assessment units shall meet the six-class Daubenmire Cover metrics and criteria set forth in Table 1.

Table 1. Daubenmire Cover Class Removal Targets for Remnant/Constructed Upland Units

Stratum	Cover Type	Daubenmire Cover Class Criteria
All	Invasive	• Cover class of 0 or 1
Canopy	Total	• Cover class of 4 or less • Assessment units measuring 4 or greater must have at least 1 canopy gap per acre
Understory	Total	• Cover class of 1 or 2
Ground	Total	• Cover class of 5 or 6
Ground	Native Aggressive Woody	• Cover class of 1 or less
Ground	Prairie Grasses	• Cover class of 1 or greater
Ground	Sun-loving Forbs	• Cover class of 1 or greater
Ground	Native Ruderal Herbaceous	• Cover class of 2 or less
Ground	Native Aggressive Herbaceous	• Cover class of 4 or less

- **Remnant or Constructed Swale/Emergent Marsh Wetland Assessment Units:**
 - All assessment units shall meet the six-class Daubenmire Cover metrics set forth in Table 2.

Table 2. Daubenmire Cover Class Removal Targets for Remnant/Constructed Wetland Units

Cover Type	Daubenmire Cover Class Criteria
Exotic Detritus	• Cover class of 2 or less
Total Vegetative Cover	• Cover class of 4 or more
Total Invasive Cover	• Cover class of 1 or less
Total Ruderal Cover	• Cover class of 2 or less
Woody Class Cover*	• Cover class of 1 or greater
Submergent Class Cover*	• Cover class of 1 or greater
Emergent Class Cover*	• Cover class of 1 or greater
Wet Meadow Class Cover*	• Cover class of 1 or greater

* Any three of these types must have a cover class of 1 or greater to be considered for BUI removal.

- **Riverine Wetlands:**
 - All assessment units falling into this category shall have an Invasive Daubenmire cover class of 1 or less. Six-class Daubenmire cover classes shall be used.

Table 3: Daubenmire Cover Classes

Cover Class	Range of Coverage	Midpoint of Range
0	<i>Not Present</i>	<i>Not Present</i>
1	Trace – 5%	2.5%
2	5 – 25%	15.0%
3	25 – 50%	37.5%
4	50 – 75%	62.5%
5	75 – 95%	85.0%
6	95 – 100%	97.5%

State of Indiana Removal Target Fish Habitat:

- Sediment remediation projects have been completed within all reaches of the Grand Calumet River and those portions of the Indiana Harbor Ship Canal lying wholly outside the federal navigation channel; and,
- The average Qualitative Habitat Evaluation Index (QHEI) score is 51 or greater within the remediated reaches, based on a minimum of two evaluations; or,
- If monitoring results indicate this value is unattainable, but the reach supports a fish community Index of Biological Integrity (IBI) of 36 or greater, a reach-specific QHEI target will be utilized. Once assigned, this value shall not decrease more than 10 percent in a subsequent evaluation.

Current Status: Impaired



Acronyms Used Throughout:

AOC: Area of Concern
BCC: Bioaccumulative chemicals of concern
BUI: Beneficial Use Impairment
CARE: Citizens Advisory for the Remediation of the Environment
CFU: [Bacterial] Colony Forming Unit
DELT: [Fish] Deformities, Eroded Fins, Lesions, and Tumors
E. coli: Escherichia coli
ECI: Energy Cooperative Incorporated
IAC: Indiana Administrative Code
IBI: Index of Biotic Integrity
IDEM: Indiana Department of Environmental Management
IHSC: Indiana Harbor Ship Canal
mIBI: macroinvertebrate Index of Biotic Integrity
MIwb: Modified Index of Well-Being
ml: milliliter
PCB: Polychlorinated biphenyl
QHEI: Qualitative Habitat Evaluation Index
RAP: Remedial Action Plan
U.S. EPA: United States Environmental Protection Agency

Inquiries:

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