



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
GREAT LAKES NATIONAL PROGRAM OFFICE  
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CHICAGO, IL 60604-3590

Ms. Diane Tecic  
Coastal Management Program Director  
Illinois Department of Natural Resources  
160 N. LaSalle St., Suite S-703  
Chicago, Illinois 60601

Dear Ms. Tecic:

Thank you for your July 31, 2020 request to remove the “*Degradation of Phytoplankton and Zooplankton Populations*” Beneficial Use Impairment (BUI) at the Waukegan Harbor Area of Concern (AOC). As you know, we share your desire to restore all the Great Lakes AOCs and to formally delist them. Based upon a review of your submittal and supporting data, the U.S. Environmental Protection Agency (EPA) hereby approves your request to remove this BUI from the Waukegan Harbor AOC. EPA will notify the International Joint Commission of this significant positive environmental change at this AOC.

We congratulate you and your staff as well as the many federal, state, and local partners who have been instrumental in achieving this environmental improvement. Removal of this BUI will benefit not only the people who live and work in the AOC, but all the residents of Illinois and the Great Lakes basin as well.

We look forward to the continuation of this productive relationship with your agency and the Waukegan Harbor Citizens Advisory Group (CAG) as we work together to delist this AOC in the years to come. If you have any further questions, please contact me at (312) 353-8320 or your staff can contact Leah Medley at (312) 886-1307.

Sincerely,

**CHRISTOPHER  
KORLESKI**

Digitally signed by  
CHRISTOPHER KORLESKI  
Date: 2020.08.04 13:02:39 -05'00'

Chris Korleski, Director  
Great Lakes National Program Office

cc: Raj Bejankiwar, IJC



JB Pritzker, Governor

Colleen Callahan, Illinois Department of Natural Resources Director

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July 31, 2020

Chris Korleski  
Areas of Concern Program  
US EPA—Great Lakes National Program Office  
77 West Jackson Blvd.  
Chicago, IL 60604

Subject: Removal of Degradation of Phytoplankton and Zooplankton Populations BUI in Waukegan Harbor AOC

Dear Mr. Korleski,

The purpose of this letter is to request that the U.S. Environmental Protection Agency – Great Lakes National Program Office (USEPA-GLNPO) approve the removal of the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment (BUI) in the Waukegan Harbor Area of Concern (AOC). Water toxicity tests that evaluated plankton growth and reproduction rates demonstrated a lack of water toxicity throughout the AOC; thus, plankton populations should no longer be considered impaired in the AOC.

The Illinois Department of Natural Resources (IDNR) has worked closely with the Waukegan Harbor Citizens Advisory Group (CAG) to evaluate the delisting target, which is consistent with the U.S. Policy Committee's Delisting Principles and Guidelines document. The delisting target for Waukegan Harbor AOC includes the use of bioassays to determine if ambient water toxicity is causing impairment in plankton populations within the AOC.

The IDNR has assessed the final data on plankton communities from Waukegan Harbor and from the reference site of North Point Marina, Illinois. Evaluation of ambient AOC water toxicity via bioassays of green algae (*Selenastrum capricornutum*) and water fleas (*Ceriodaphnia dubia*) that quantified plankton growth and reproduction rates demonstrated a lack of water toxicity throughout the AOC. Specifically,

- Green algae (*Selenastrum capricornutum*) toxicity tests demonstrated mean cell densities in site waters were greater than the test acceptability criteria of 1 million cells/mL.
- Zooplankton (*Ceriodaphnia dubia*) toxicity tests revealed no consistent trend of poor reproduction at any site within the AOC or non-AOC reference site; furthermore, all Waukegan Harbor AOC sites had mean reproduction values greater than the test acceptability criteria of 15 young per female.
- Zooplankton (*Ceriodaphnia dubia*) survival rates at all sites from all testing dates were greater than 90%.



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IDNR and the CAG feel that the Waukegan Harbor AOC has met the criterion for removal of the Degradation of Phytoplankton and Zooplankton Populations BUI and that the BUI should be removed from the list of impairments in this AOC.

Enclosed, please find the supporting documentation for the removal of the Degradation of Phytoplankton and Zooplankton Populations BUI in Waukegan Harbor AOC and recommendation letters from the Waukegan Harbor CAG and City of Waukegan.

We look forward to our continuing partnership with the AOC program and working closely with the USEPA-GLNPO to achieve the remaining delisting targets.

Sincerely,

A handwritten signature in blue ink that reads "Diane Tecic".

Diane Tecic  
IDNR Coastal Management Program Director

**Waukegan Harbor Area of Concern**

*Proposed Recommendation for Removal of the Degradation of Phytoplankton and Zooplankton*

*Populations Beneficial Use Impairment*

Illinois Department of Natural Resources  
Coastal Management Program  
July 2020

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## Executive Summary

The Waukegan Harbor Area of Concern (AOC), situated in northeastern Illinois on the western shore of Lake Michigan, is a commercial and recreational harbor located approximately 40 miles north of Chicago. In 1975, polychlorinated biphenyl compounds (PCBs) were found in Waukegan Harbor as a result of manufacturing activities in the heavily industrialized harbor district. In addition to PCBs, other chemical contaminants including heavy metals, nitrogen, volatile solids, polycyclic aromatic hydrocarbons (PAHs), and phenols have been found in and around Waukegan Harbor. These chemical contaminants severely impacted Waukegan Harbor and the surrounding area, environmentally, socially, and economically, so in 1987 the International Joint Commission (IJC), under the authority of the binational Great Lakes Water Quality Agreement, identified Waukegan Harbor as an AOC and identified six Beneficial Use Impairments (BUIs) resulting from chemical contamination.

The Degradation of Phytoplankton and Zooplankton Populations BUI in Waukegan Harbor was demonstrated by inhibited photosynthesis of green algae (*Selenastrum capricornutum*) and toxicity effects to *Daphnia magna*, *Ceriodaphnia dubia*, and *Selenastrum capricornutum* in the presence of sediment elutriates from the AOC (Illinois Environmental Protection Agency, 1999). Ross et al. (1988) found sediment contamination from Slip 3 (Figure 1) significantly altered the structure of protozoan communities commonly found within and near the AOC. These impacts to protozoans were positively correlated with areas having high suspension rates of contaminated particles, such as would be found in the lower water column of the AOC (Ross et al., 1988). In addition, water flea (*Daphnia magna*) mortalities of up to 100 percent were documented in the presence of sediment suspension samples taken from the AOC (Marking et al., 1981).

In 2013, environmental dredging of Waukegan Harbor was completed and PCB concentrations in harbor sediments were reduced below the 0.2 parts per million (ppm) target level established by United States Environmental Protection Agency (USEPA) and the State of Illinois, therefore reducing potential impacts of sediment contamination on plankton populations. To monitor the plankton community response, a series of community surveys were conducted in 2012 (pre-dredging), and in 2015 and 2017 (post-dredging). The pre-dredging plankton community surveys in 2012 were conducted using reference sites at Burns Harbor, Indiana. These pre-dredging surveys showed higher plankton diversity at Waukegan Harbor AOC than at the reference site, but higher total plankton numbers at the reference site as compared to Waukegan Harbor AOC. In 2015, the first round of post-dredging surveys were conducted and showed strong seasonal differences in the plankton communities both within sites and between the reference sites and Waukegan Harbor AOC. There were also significant differences in community composition between Waukegan Harbor AOC and reference sites located in Burns Harbor. Both the 2012 and 2015 surveys were generally inconclusive and displayed strong seasonal effects. Additionally, these surveys highlighted the challenges in finding an appropriate reference site that reduced confounding factors (e.g. seasonal temperatures, harbor conditions, and benthic structure). Therefore, additional surveys were planned for 2017 and a new reference site of North Point Marina was established as it is in close proximity to Waukegan Harbor and experiences similar environmental conditions.

Phytoplankton community surveys conducted in 2017 showed a lack of overlap in community structure between the AOC and reference sites in North Point Marina, and there were strong seasonal shifts that differed greatly between the AOC and non-AOC sites. However, there were no significant differences in zooplankton density or species richness between AOC and reference sites. In addition to these community surveys, acute and chronic toxicities of waters from 10 sampling locations were quantified to test the hypothesis that toxicity of waters from AOC sites was not higher than that of waters from non-AOC sites or the nearshore of Lake Michigan. Evaluation of ambient AOC water toxicity via bioassays of green algae (*Selenastrum capricornutum*) and water fleas (*Ceriodaphnia dubia*) that evaluated plankton growth and reproduction rates demonstrated a lack of water toxicity throughout the AOC. Based on the results of these toxicity tests, IDNR recommends the removal of the Degradation of Phytoplankton and Zooplankton Populations BUI. The following results support this recommendation:

- Green algae (*Selenastrum capricornutum*) toxicity tests demonstrated mean cell densities in site waters were greater than the test acceptability criteria of 1 million cells/mL.
- Zooplankton (*Ceriodaphnia dubia*) toxicity tests revealed no consistent trend of poor reproduction at any site within the AOC or non-AOC reference site; furthermore, all Waukegan Harbor AOC sites had mean reproduction values greater than the test acceptability criteria of 15 young per female.
- Zooplankton (*Ceriodaphnia dubia*) survival rates at all sites from all testing dates were greater than 90%.

## Purpose

The purpose of this document is to summarize activities that have been undertaken to evaluate the impairment of phytoplankton and zooplankton communities in the Waukegan Harbor Area of Concern (AOC), and to provide rationale for the removal of the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment (BUI). The document also summarizes activities performed to remove polychlorinated biphenyl compounds (PCBs) and other chemical contaminants including heavy metals, nitrogen, volatile solids, polycyclic aromatic hydrocarbons (PAHs), and phenols that negatively impact the plankton community in Waukegan Harbor.

## Geographic Extent and Area of Concern Boundary

Waukegan Harbor is located on the west shore of Lake Michigan in Waukegan, Illinois, approximately 40 miles north of Chicago, and was built in the 1840s. Waukegan Harbor is a deep-draft commercial, recreational, and harbor of refuge ranging in depth from 14 to 21 feet with limited natural water exchange with Lake Michigan. The bottom of the harbor is covered with one to 10.5 feet of organic silt over nine feet of coarse to fine sand (Environmental Consulting & Technology, 2008). With exceptions of the recreational boat launching area at the Waukegan Port District and the retaining wall near the mouth of the harbor, the entire harbor is surrounded by a steel sheet piling wall that extends into the sand layer, limiting the potential for natural shoreline habitats. The harbor is presently surrounded by industrial, commercial, municipal, recreational, open, and vacant lands. The AOC is bounded on the

north by the North Ditch, on the west by Canadian National Railway, and on the south by Government Pier (Figure 1).

USEPA subdivides the Waukegan Harbor AOC into four Operable Units (Figure 1). Operable Unit #1 encompasses Waukegan Harbor and Slip 4, Operable Unit #2 encompasses the former Waukegan Manufactured Gas and Coke Plant, Operable Unit #3 encompasses three PCB Containment Cells (East and West Containment Cells and Former Slip 3), and Operable Unit #4 encompasses the former site of Outboard Marine Corporation (OMC) Plant 2.

The Waukegan Harbor AOC is jointly managed by the Illinois Department of Natural Resources (IDNR), the Illinois Environmental Protection Agency (IEPA), and the Waukegan Harbor Citizens Advisory Group (CAG). Immediately following the formation of the Waukegan Harbor CAG in 1990, IEPA, CAG, and members of the public met and developed what is known as the Waukegan Harbor Extended Area of Concern or Extended Study Area (ESA). The ESA addresses additional known areas of contamination that affect the Waukegan Harbor vicinity and impact the nearshore waters of Lake Michigan. The ESA extends from the Dead River south into the City of North Chicago, ending at 22<sup>nd</sup> Street and includes all lands to the east of Sheridan Road (Figure 2). While sites within the ESA are critical to the health and sustainability of Waukegan Harbor and nearshore Lake Michigan, the Degradation of Phytoplankton and Zooplankton BUI is focused in the AOC only, and data collection on the health of plankton communities did not extend into the ESA.



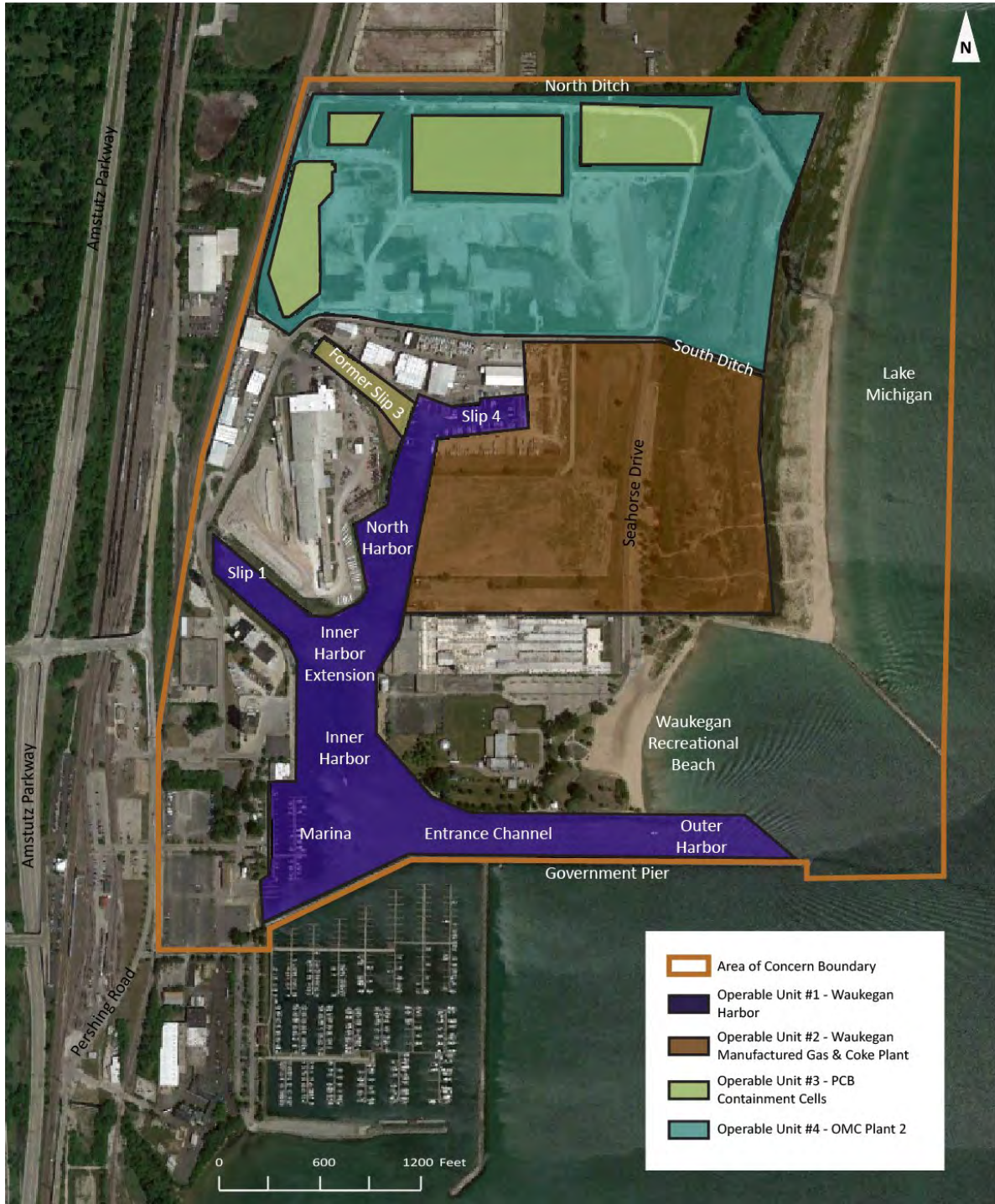


Figure 1. Waukegan Harbor and Area of Concern boundary and USEPA OMC Superfund Site's Operable Units.



Figure 2. Waukegan Harbor Extended Study Area (Extended Area of Concern).

## Overview of Waukegan Harbor AOC

In 1975, PCB contamination was discovered in Waukegan Harbor as a result of manufacturing activities at Outboard Marine Corporation (OMC). In the 1987 amendments to the Great Lakes Water Quality Agreement, the International Joint Commission (IJC) identified Waukegan Harbor as an AOC and identified six BUIs. BUIs for the Waukegan Harbor AOC are as follows:

1. Restrictions on Dredging Activities
2. Degradation of Benthos
3. Degradation of Phytoplankton and Zooplankton Populations
4. Restrictions on Fish and Wildlife Consumption
5. Loss of Fish and Wildlife Habitat
6. Beach Closings

The first four BUIs are the result of industrial contamination from manufacturing activities at OMC where hydraulic fluids containing PCBs were discharged through floor drains at the OMC plant and released directly into Waukegan Harbor via old Slip 3 and the North Ditch. The Restriction on Dredging BUI was removed in 2014 after dredging by USEPA reduced PCB concentrations in Waukegan Harbor sediments to below the 0.2 parts per million (ppm) target level. The Degradation of Benthos BUI was removed in 2017 after consideration of the remediation actions that had been completed and the strength of the supporting data that demonstrated sediment PCB levels are within the required limits and the benthic community in Waukegan Harbor AOC is not statistically different than that of a reference harbor. The Restrictions on Fish and Wildlife Consumption BUI is in the monitoring phase.

The fifth BUI is a result of the urbanized and industrialized nature of the Waukegan Harbor lakefront and the impacts from resulting legacy contaminants on fish and wildlife. The wildlife habitat that exists is also threatened by several invasive species. A habitat management plan was developed for the AOC and in 2010, Waukegan Harbor CAG received a Great Lakes Restoration Initiative (GLRI) grant to manage invasive species in the AOC and ESA. Under this GLRI grant, from 2010-2016 Waukegan Harbor CAG managed herbaceous and woody invasive species as part of the Illinois Beach State Park Southern Buffer Restoration project. Due to successful management actions, the Loss of Fish and Wildlife Habitat BUI was removed in 2013. In 2016, supported by a grant from the Illinois Department of Natural Resources (IDNR) Coastal Management Program (CMP), a comprehensive Beach Management Plan was developed for the City of Waukegan. This Beach Management Plan provides the City of Waukegan the necessary guidance to manage its beaches and dunes for both recreation and plant and wildlife habitat. Management of invasive species will continue by the City of Waukegan with support from IDNR.

The sixth BUI, Beach Closings, was primarily the result of high bacteria levels from fecal contamination and gull activity on the two beaches within the confines of the Waukegan Harbor AOC. These issues have been resolved, and this BUI was removed in 2011.

## Degradation of Phytoplankton and Zooplankton Populations BUI

The Degradation of Phytoplankton and Zooplankton Populations BUI in Waukegan Harbor was demonstrated by inhibited photosynthesis of green algae (*Selenastrum capricornutum*) and toxicity

effects to *Daphnia magna*, *Ceriodaphnia dubia*, and *Selenastrum capricornutum* in the presence of sediment elutriates from the AOC (Illinois Environmental Protection Agency, 1999). Ross et al. (1988) found sediment contamination from Slip 3 (Figure 1) significantly altered the structure of protozoan communities commonly found within and near the AOC. These impacts to protozoans were positively correlated with areas having high suspension rates of contaminated particles, such as would be found in the lower water column of the AOC (Ross et al., 1988). In addition, water flea (*Daphnia magna*) mortalities of up to 100 percent were documented in the presence of sediment suspension samples taken from the AOC (Marking et al., 1981).

### **Remedial Action Plans and Restoration Targets**

The IEPA, in partnership with the Waukegan Harbor CAG, completed the Stage I Remedial Action Plan (RAP) in 1993, the Stage II RAP in 1995, and the Stage III RAP in 1999. The final RAP identified restoration goals for each of the six BUIs; however, these restoration goals were established before USEPA published “Restoring United States Areas of Concern: Delisting Principles and Guidelines” in December of 2001. As a result, USEPA and IEPA funded a project to review, revise, and update the restoration goals listed in the Stage III RAP using the consulting firm Environmental Consulting & Technology, Inc. and a technical team that included CAG and IEPA. The resulting document, “Delisting Targets for the Waukegan Harbor Area of Concern: Final Report,” was completed in October 2008. This document, identifying specific delisting targets, was a cooperative effort of expert personnel knowledgeable in the local conditions of the AOC and representing the international, federal, state, regional, and community levels. This report is the current guiding document for RAP and delisting activities for the Waukegan Harbor AOC and provides the definitive guidance to determine at what point the AOC is clean enough that the impaired beneficial uses can be considered for delisting.

Per IJC guidelines, informed and backed by IEPA and the Waukegan Harbor CAG, the Degradation of Phytoplankton and Zooplankton Populations BUI can be “considered for delisting when:

1. A baseline condition has been established to evaluate the extent of this impairment. Phytoplankton and zooplankton community surveys should be conducted and compared to a nonimpacted or minimally impacted harbor type reference site to set the baseline condition. If the community structure is statistically different than the reference conditions, this BU should be considered impaired.
2. If the BU is considered to be impaired, then identify the factors leading to this impairment.
  - a. Ambient water chemistry sampling should be conducted to determine if nutrient enrichment is the main contributor. If nutrients are the main contributor, the BUI can be considered for delisting when the sources causing nutrient enrichment to the AOC are identified and controlled.
  - b. If nutrient enrichment is not considered the cause of the impairment, conduct bioassays to determine if ambient water toxicity is causing impairment.
  - c. Identify the sources of the toxicity and eliminate/control those sources.

3. The phytoplankton/zooplankton community is representative of similar harbor related communities in population and species compared to an acceptable harbor control site.” (Environmental Consulting & Technology, 2008)

### ***Summary of Management Actions Implemented to Address the Degradation of Phytoplankton and Zooplankton Populations BUI***

Initial sediment cleanup of the Waukegan Harbor was performed in 1992-1993, resulting in the removal of approximately one million pounds of PCBs, 95% of the total estimated PCB contamination released. In 2001, three shipping companies that utilize Waukegan Harbor invested in the dredging of Slip 1 to analyze sediment consistency, demonstrate on-site dewatering, and reinforce corporate buy-in to the harbor clean-up. Through this project, an additional 4,000 cubic yards of sediment were removed.

In 2002, USEPA Region 5 Superfund Division, with assistance from IEPA and Illinois Department of Public Health (IDPH), conducted a 5-Year Review of the site to determine the extent to which the 1992-1993 efforts were successful in protecting human health and the environment. Results of this review showed PCB levels in harbor-caught fish were still too high to be protective of human health and the 50-ppm cleanup level for PCBs was much higher than target remediation levels at other contaminated sediment sites, causing USEPA, IEPA, and area stakeholders to determine a second cleanup action for Waukegan Harbor was needed. In 2003, sediment sampling occurred in Waukegan Harbor to help the USEPA and United States Army Corps of Engineers (USACE) determine the extent of remaining contamination and evaluate remediation options.

In 2002-2003 USEPA removed and properly disposed of large amounts of acids, bases, paints, solvents, hydraulic oil, machining oil, compressed gases, metals, sludge, and transformer fluids containing PCBs from Operable Unit #4 (site of OMC Plant 2). In 2005, soil removal activities at Operable Site #2 (site of Waukegan Manufactured Gas and Coke Plant), located adjacent to the North Harbor and south of Slip 4, were completed. In 2011, active groundwater cleanup at the same site was completed and USEPA continues to apply a monitored natural attenuation approach towards the cleanup of residual groundwater contaminants. These activities have resulted in cleaner groundwater and eliminated potentially contaminated runoff from the site.

Waukegan Harbor CAG was a valuable partner in pre-dredging clean-up activities, raising all in-kind funding required for the above remediation projects.

In 2012-2013 another round of harbor sediment dredging occurred, and environmental dredging was completed on July 8th, 2013. The dredged sediment was pumped out of the harbor to the former OMC Plant 2 site for processing and placement in an 8-acre consolidation facility located at the north end of the site. The environmental dredging of 2012-2013 resulted in the removal of an additional 124,244 cubic yards of sediment and successfully reduced PCB concentrations in harbor sediments below the 0.2 ppm target level. With the 2012-2013 dredging and removal of the contaminated sediments, all management actions related to harbor sediments were completed. In 2014 PCB removal at Operable Unit #4 (site of OMC Plant 2) was completed, thereby fulfilling all management actions for the AOC.

## Supporting Data and Assessment

Following the recommended sequence presented in the delisting guidelines, phytoplankton and zooplankton communities were initially surveyed to assess community condition and compare the AOC plankton community to that of a non-AOC reference site. Surveys conducted by Battelle in 2012 (pre-remediation) and the United States Geological Survey (USGS) in 2015 (post-remediation) were largely inconclusive, so plankton community surveys were conducted again in 2017. These 2017 surveys attempted to replicate the methods of earlier surveys while adding additional sampling dates and a water toxicity component to further evaluate the status of this BUI, as recommended in the delisting guidelines. A summary of AOC and non-AOC surveys is presented below.

- July and August, 2012: Pre-remediation phytoplankton and zooplankton community surveys conducted by Battelle in conjunction with benthic invertebrate surveys
- June and August, 2015: Post-dredging phytoplankton and zooplankton community surveys conducted by United States Geological Survey in conjunction with benthic invertebrate surveys
- July, August, September, and October, 2017: Phytoplankton and zooplankton community surveys and water toxicity testing conducted by Illinois Natural History Survey

This BUI removal document primarily focuses on the results of the water toxicity tests because they provide the evidence on which the decision to apply for the removal of the Degradation of Phytoplankton and Zooplankton Populations BUI is based.

### *Plankton Community Surveys*

The degradation of phytoplankton and zooplankton populations impairment was initially assessed by sampling pre- and post-remediation phytoplankton and zooplankton communities to enable a comparison of community metrics in Waukegan Harbor AOC with a non-AOC reference site. In 2012, Battelle conducted pre-remediation plankton community assessments in the AOC and Burns Harbor, Indiana (a non-AOC reference site). For this study, Burns Harbor was chosen because of its similar physical characteristics to Waukegan Harbor AOC. Like Waukegan Harbor, Burns Harbor is a deep-draft, man-made commercial harbor with no riverine input. In 2015, USEPA and the United States Geological Survey (USGS) conducted post-remediation plankton community surveys in both Waukegan Harbor AOC and Burns Harbor to assess whether the plankton community in Waukegan Harbor AOC was degraded when compared to a non-AOC harbor of similar characteristics. Results of the 2012 and 2015 surveys are summarized in Appendix A and Appendix B, respectively. While there were some similarities between AOC and non-AOC communities, the high variability of community metrics across seasons and sampling sites led CMP, with input from USEPA, to contract another round of community sampling in 2017 to further assess this impairment.

INHS conducted the second round of post-remediation plankton community surveys in 2017 to assess the status of this BUI. The 2017 surveys built upon earlier surveys by sampling the plankton community with greater frequency, adding sampling sites in nearshore waters of Lake Michigan, and more thoroughly evaluating water quality and measuring water toxicity at all sampling sites to address possible causes of the high community variability observed in earlier studies. In addition, the 2017

surveys selected North Point Marina in Winthrop Harbor, IL as the non-AOC reference due to its proximity to the AOC in an attempt to control for local meteorological and temperature impacts to plankton communities. NPM, like Burns Harbor, is similar in physical characteristics to Waukegan Harbor AOC.

The 2017 plankton community analyses, summarized in Appendix C, again showed a high degree of variability in community descriptors across all sampling dates and sites; thus, results were again generally inconclusive in their ability to indicate degradation. Due to the complex and highly variable nature of plankton communities, differences between AOC and non-AOC communities could be attributed to several factors other than degradation of the AOC environment. Factors such as natural variation in nearshore communities, patchy blooming patterns in one or more dominant taxa, and differences in harbor depths and substrates make it difficult to assess the degradation of phytoplankton and zooplankton populations impairment using community composition metrics alone. In addition, authors of the 2017 study (Peterson et al., 2019) identified the unique physical characteristics of Waukegan Harbor AOC as a barrier to finding a suitable non-AOC reference site for comparing plankton communities. Because Waukegan Harbor AOC is a commercial deep-draft harbor, comparisons to a recreational marina such as NPM are difficult as the plankton communities in shallow marinas tend to be dominated by benthic organisms. However, the nearest comparable deep-draft commercial harbor (Burns Harbor) is far enough away (approximately 97-kilometers south of Waukegan AOC) to experience drastically different meteorological conditions and temperature seasonality, making it difficult to discern impacts of these variables on plankton communities from impacts of environmental degradation.

While plankton community surveys in the AOC and non-AOC reference sites were inconclusive in assessing the level of degradation in the AOC communities, the detailed surveys conducted between 2012 and 2017 provided a wealth of knowledge about nearshore and harbor phytoplankton and zooplankton communities in southern Lake Michigan. Future use of these data could include lower trophic-level studies, developing harmful algal bloom (HAB) monitoring indicators, and developing indicators for nutrient runoff hotspots.

### ***Water Toxicity Tests***

In 2017, CMP contracted with Illinois Natural History Survey (INHS) to conduct toxicity testing via bioassays with freshwater green algae (*Selenastrum capricornutum*<sup>1</sup>) for analysis of phytoplankton and water fleas (*Ceriodaphnia dubia*) for analysis of zooplankton. Waters were collected from sampling locations throughout Waukegan Harbor AOC, North Point Marina non-AOC reference site, and sites in nearshore Lake Michigan (Figure 3 and Figure 4). North Point Marina (NPM) was chosen as the non-AOC reference site because of its proximity to Waukegan Harbor (NPM is 14-kilometers north of Waukegan

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<sup>1</sup> *Selenastrum capricornutum* has been renamed *Pseudokirchneriella subcapitata*. For the purposes of this document, we will continue to use the name *S. capricornutum* to maintain consistency with USEPA Test Method 1003.0 and Peterson et al., 2019.

Harbor) and similar physical characteristics (NPM is also a man-made harbor with no riverine input). While toxicity results cannot conclusively prove that phytoplankton and zooplankton communities are healthy compared to those in non-impacted or minimally-impacted systems, they do provide an acceptable proxy for water quality throughout the U.S. (USEPA, 2002) and are used for removal criteria for plankton-related BUIs in AOCs throughout the Great Lakes (George, T.K. & Boyd, D., 2007). In addition, unlike community-based metrics, water toxicity measurements can control for complex natural variations in plankton assemblages that are driven by factors such as hydrological forces, seasonal and daily shifts in temperature and light, and natural spatial fluctuations in the water column (George, T.K. & Boyd, D., 2007 and Stemberger et al., 2001).

*Selenastrum capricornutum* and *Ceriodaphnia dubia* are used for chronic toxicity testing because they are broadly distributed throughout many freshwater habitats, they represent an important link and significant food source in the aquatic food web, they have short life cycles and are easy to culture in a laboratory setting, and they are sensitive to a wide range of contaminants (New York State Department of Environmental Conservation, 2016 and Wisconsin Department of Natural Resources, 2004). In addition, USEPA has developed standard bioassays to quantify *Selenastrum capricornutum* and *Ceriodaphnia dubia* (USEPA Test Methods 1003.0 and 1002.0, respectively) responses to acute or chronic toxicity in freshwater environments and in turn estimate the toxicity of effluents or ambient waters (USEPA, 2002).



Figure 3. Map of sampling locations within the Waukegan Harbor AOC: WH1 (Outer Harbor), WH3 (Inner Harbor Extension), WH4 (Launch/Inner Harbor), and WH5 (North Harbor) (Peterson et al., 2019).





Figure 4. Map of sampling locations within the North Point Marina non-AOC reference site: NP1 (Outer Harbor), NP3 (Inner Harbor), NP4 (Launch), and NP5 (South Harbor) (Peterson et al., 2019).

Water toxicity tests were performed on samples collected on three different dates from the Waukegan Harbor AOC, NPM reference, and nearshore Lake Michigan sites. During the phytoplankton green algae growth tests, *Selenastrum capricornutum* was exposed in a static system to water samples collected at each sampling location for 96 hours. The response of the green alga was measured in changes to cell density (cells per milliliter (ml)), biomass, chlorophyll content, or absorbance (USEPA, 2002). Results of these tests showed mean green algal cell densities from Waukegan Harbor AOC sites were greater than the test acceptability criterion of 1 million cells per ml (Figure 5). In addition, no significant differences in mean algal growth were observed among treatments from either Waukegan Harbor AOC or North Point Marina non-AOC in any of the three testing dates (August 2017, September 2017, and October 2017) (Figure 5). (Peterson et al., 2019)

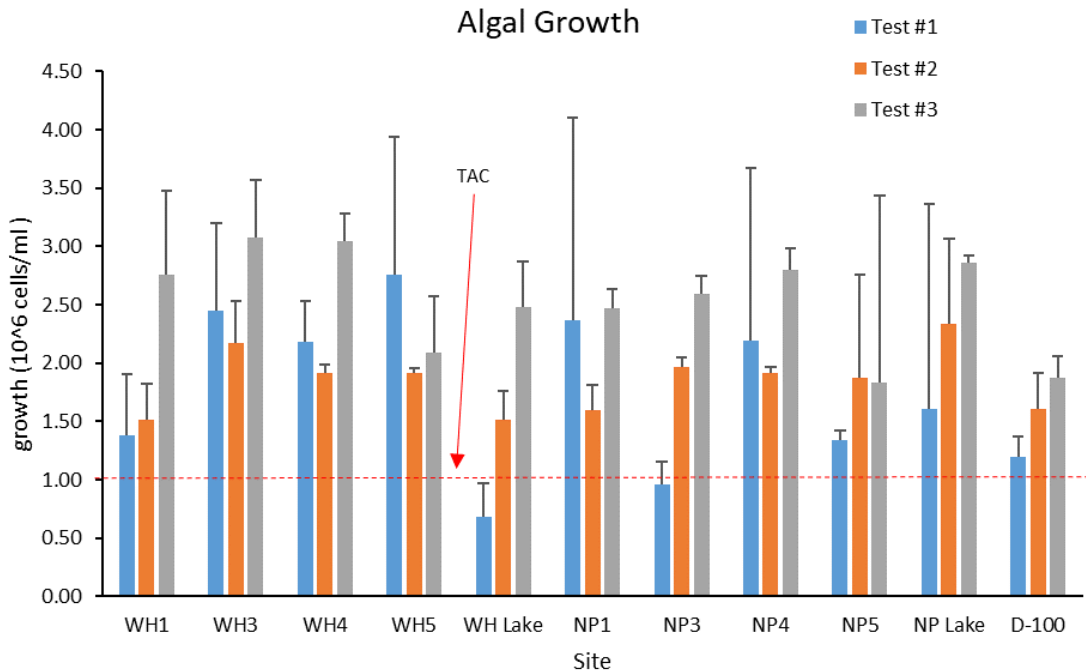


Figure 5. Growth of green alga (*Selenastrum capricornutum*) in waters from Waukegan Harbor AOC, North Point Marina non-AOC, and a control water (D-100). There were no statistically significant differences among means for any of the three tests. Test #1 was conducted August 15-18, 2017; Test #2 was conducted September 26-30, 2017; Test #3 was conducted October 17-21, 2017. Error bars are standard deviations. TAC = test acceptability criteria for control water. From Peterson, S.D., Soucek, D.J., Dickinson, A., Reed, E.M., & Czesny, S.J., 2019.

During the zooplankton survival and reproduction tests, *Ceriodaphnia dubia* was exposed in a static renewal system to water samples collected at each sampling location until 60% or more of surviving control females had three broods of offspring. For the test to be completed, the surviving control organisms should produce 15 or more young in three broods. If these criteria are not met at the end of 8 days, the test must be repeated (USEPA, 2002). These zooplankton toxicity tests resulted in survival rates greater than 90% in all sites from each sampling date (August 2017, September 2017, and October 2017), so statistical comparisons were limited to zooplankton reproduction rates. Only the August 2017 test (Test #1) resulted in statistically significantly different zooplankton reproduction values between Waukegan Harbor and NPM sites. Results of Test #1 showed zooplankton reproduction values in Waukegan Harbor samples WH1 and WH4, the nearshore open-lake site WH-Lake, and NPM samples NP3 and NP5 were all significantly lower than that of NPM site NP4 (Figure 6). However, all sites in the August 2017 test had mean reproduction values greater than the test acceptability criteria of 15 young per female. (Peterson et al., 2019)

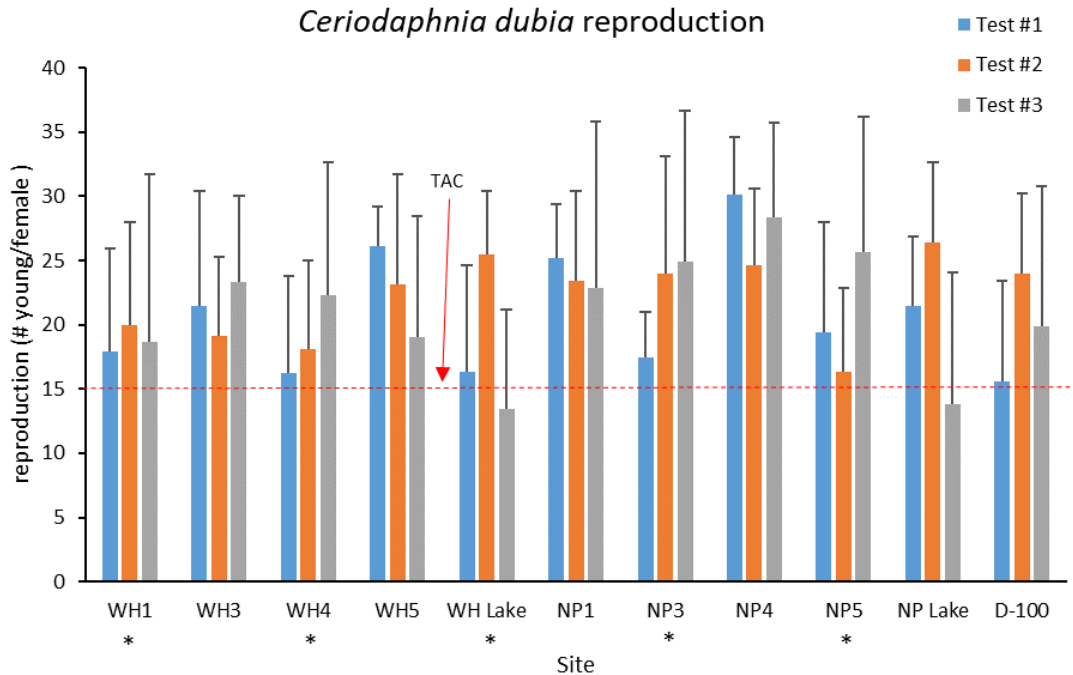


Figure 6. Reproduction of the daphnid *Ceriodaphnia dubia* in waters from Waukegan Harbor AOC, North Point Marina non-AOC, and a control water (D-100). For Test #1, treatments delineated by an asterisk (\*) had mean reproduction statistically significantly different from that of site NP4; remaining treatments were not significantly different from either NP4 or the sites delineated by \*. There were no significant differences in reproduction among sites in Test #2 and #3. Test #1 was started August 15, 2017; Test #2 was started September 26, 2017; Test #3 was started October 17, 2017. Error bars are standard deviations. TAC = test acceptability criteria for control water. From Peterson, S.D., Soucek, D.J., Dickinson, A., Reed, E.M., & Czesny, S.J., 2019.

Based on the above factors, Peterson et al. (2019) concluded the alga growth tests did not identify any toxic samples. Furthermore, there was no consistent trend of poor zooplankton reproduction at any site in the Waukegan Harbor AOC on any sampling date, suggesting a lack of toxicity in site waters. Therefore, results of these 2017 bioassays support BUI removal.

## Conclusions and Recommendations

In consideration of the remediation actions that have been completed and the strength of the supporting data that demonstrate a lack of toxicity in ambient AOC waters, IDNR recommends the removal of the Degradation of Phytoplankton and Zooplankton Populations BUI. The following data support this recommendation:

- Green alga (*Selenastrum capricornutum*) toxicity tests demonstrated mean cell densities in site waters were greater than the test acceptability criteria of 1 million cells/ml.
- Zooplankton (*Ceriodaphnia dubia*) toxicity tests revealed no consistent trend of poor reproduction at any site within the AOC or non-AOC reference site; furthermore, all Waukegan Harbor AOC sites had mean reproduction values greater than the test acceptability criteria of 15 young per female.

- Zooplankton (*Ceriodaphnia dubia*) survival rates at all sites from all testing dates were greater than 90%.

## Public Involvement

The Waukegan Harbor CAG has been guiding the cleanup progress in Waukegan Harbor, the Area of Concern, and the Extended Area of Concern since August of 1990. For the first 15 years, IEPA functioned as the lead state agency with USACE leading sediment management actions on the ground as the lead federal agency in partnership with the Waukegan Harbor CAG. In the early 2000s, USEPA took on a more active role at the local level and continues their strong involvement today as a lead federal agency. In late 2011, IDNR CMP became the lead state agency and has been directing BUI removals and coordinating the testing and monitoring of harbor sediments and organisms as part of the required federal cleanup process.

The Waukegan Harbor CAG is comprised of local businesses and corporations, municipal bodies, local, regional, state, and federal environmental agencies, and educational, fisheries, and environmental organizations. This group meets monthly (except during COVID-19) to discuss and respond to environmental issues in the AOC and ESA and has provided strong leadership in the harbor cleanup efforts.

The Waukegan Harbor CAG regularly coordinates with regional AOC and Lake Michigan-wide stakeholders, private citizens, local, state, and national environmental and educational organizations, and corporations to disseminate information about Waukegan AOC history, cleanup, and restoration efforts, and the current status of remediation. CAG members engage in public outreach via presentations at meetings, conferences, and in Waukegan-area schools, and by providing on-site tours of AOC project sites. Waukegan Harbor CAG also sponsors visits from the W.G. Jackson (a Great Lakes research vessel based at Grand Valley State University in Muskegon, Michigan) for hands-on citizen science to familiarize the public and local and state representatives with the AOC's history and remediation status, and to introduce children and adults to the science of the Great Lakes.

Representatives of state and federal agencies attend monthly CAG meetings to report on cleanup and monitoring progress and gather input from attendees. IDNR CMP and INHS have presented updates and study results related to the Degradation of Phytoplankton and Zooplankton Populations BUI at CAG meetings and IDNR CMP solicited and included comments from the Waukegan Harbor CAG during the public comment period for this BUI removal document (Appendix D).

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**APPENDIX A**  
**Summary of 2012 Plankton Community Data**

**Table 1.** Summary of the abundance of factions of the plankton community at both the Waukegan Harbor Area of Concern and Burns Harbor reference sites. Adapted from Battelle, 2013.

	Station	Zooplankton (#/m <sup>3</sup> ) of Families		Rotifers (#/m <sup>3</sup> )		Phytoplankton and Diatoms (#/m <sup>3</sup> )	
		July	August	July	August	July	August
Burns Harbor, IN (non-AOC)	BH1	9,554	2,274	17,500	58,500	510,815,056	1,372,544,923
	BH3	3,149	1,322	18,000	132,000	459,216,065	942,402,784
	BH5	21,561	1,734	58,000	39,000	405,760,770	500,133,647
	<b>Mean</b>	<b>11,421</b>	<b>1,777</b>	<b>31,167</b>	<b>85,500</b>	<b>458,597,297</b>	<b>938,360,451</b>
Waukegan Harbor, IL (AOC)	Outer Harbor (WH1)	2,392	11,202	14,000	97,000	428,376,899	183,730,233
	Inner Harbor (WH3)	2,255	42,227	6,500	78,000	194,309,105	94,834,024
	North Harbor (WH5)	1,261	66,032	7,000	13,000	122,884,957	344,687,341
	<b>Mean</b>	<b>1,969</b>	<b>39,820</b>	<b>9,167</b>	<b>62,667</b>	<b>248,523,654</b>	<b>207,750,533</b>

**Table 2.** Diversity values for plankton samples collected in 2012 by Battelle at Waukegan Harbor Area of Concern and Burns Harbor-Port of Indiana non-Area of Concern. <sup>1</sup>Diversity calculated as the Shannon-Weaver Diversity Index. <sup>2</sup>Combined plankton represents the combination of large-cell zooplankton, rotifers, and phytoplankton. Adapted from Battelle, 2013.

Site	Station	Season	Large-Cell Zooplankton	Rotifer	Phytoplankton	Combined Plankton Community <sup>2</sup>
			Diversity <sup>1</sup>	Diversity	Diversity	Diversity
Burns Harbor, IN (non-AOC)	BH1	July	0.38	1.12	1.89	1.89
		August	0.9	0.86	1.54	1.54
	BH3	July	0.2	0.83	2.32	2.32
		August	1.41	0.75	1.26	1.26
	BH5	July	0.39	1.14	1.77	1.78
		August	1.89	1.10	1.64	1.64
Waukegan Harbor, IL (AOC)	Outer Harbor (WH1)	July	0.84	1.23	2.39	2.39
		August	0.26	0.89	2.78	2.79
	Inner Harbor (WH3)	July	1.49	0.94	2.82	2.82
		August	0.84	1.09	3.42	3.42
	North Harbor (WH5)	July	1.64	1.35	3.06	3.06
		August	0.46	1.35	3.12	3.12



**APPENDIX B**  
**Summary of 2015 Plankton Community Data**

**Table 1.** Richness and diversity values for plankton samples collected in 2015 by the U.S. Geological Survey at Waukegan Harbor Area of Concern and Burns Harbor-Port of Indiana non-Area of Concern. <sup>1</sup>Richness computed as the number of unique taxa in the sample. <sup>2</sup>Shannon Diversity, calculated as  $\log_e$ . <sup>3</sup>Combined phytoplankton represents the combination of soft algae and diatoms. Adapted from Scudder Eikenberry, Templar, Burns, Dobrowolski, & Schmude, 2017.

Site	Station	Season	Zooplankton		Diatoms		Soft Algae		Combined Phytoplankton <sup>3</sup>	
			Richness <sup>1</sup>	Diversity <sup>2</sup>	Richness	Diversity	Richness	Diversity	Richness	Diversity
Burns Harbor, IN (non-AOC)	BH1	June	19	1.35	48	3.18	8	0.68	56	2.74
		August	15	1.11	46	2.13	12	1.40	58	2.13
	BH3	June	20	1.74	46	3.15	9	0.77	55	2.62
		August	12	0.67	53	2.75	13	2.01	66	3.06
	BH5	June	19	1.52	54	3.21	7	0.61	61	2.12
		August	15	1.41	48	2.49	13	1.51	61	2.66
Waukegan Harbor, IL (AOC)	Outer Harbor (WH1)	June	13	0.79	60	3.00	9	0.78	69	1.66
		August	20	2.22	60	3.15	6	0.54	66	1.55
	Inner Harbor (WH3)	June	3	0.09	62	3.26	7	0.53	69	1.34
		August	20	1.75	46	2.48	8	1.55	54	2.76
	North Harbor (WH5)	June	15	0.89	65	3.39	5	0.61	70	2.19
		August	18	1.82	62	2.92	9	0.67	71	1.47

**APPENDIX C**  
**Summary of 2017 Plankton Community Data**

**Table 1.** Richness and diversity values for zooplankton and phytoplankton samples collected at Waukegan Harbor AOC, North Point Marina (non-AOC), and nearshore sites in 2017 by INHS. <sup>1</sup>Richness calculated as mean taxa richness. <sup>2</sup>Shannon Diversity, calculated as  $\log_e$ . Adapted from Peterson, S.D., Soucek, D.J., Dickinson, A., Reed, E.M., & Czesny, S.J., 2019.

Site	Sampling Event	Zooplankton		Phytoplankton	
		Richness <sup>1</sup>	Diversity <sup>2</sup>	Richness	Diversity
Waukegan Harbor (AOC)	July 31	17.3	1.0	10.5	1.1
	August 15	22.3	2.0	13.0	1.2
	September 6	21	1.7	13.8	1.1
	September 18	18.8	1.8	13.8	1.2
	October 4	20.5	1.8	10.3	0.8
	October 19	20.5	1.8	9.5	1.1
Waukegan- Lake	July 31	16	1.5	13.0	1.2
	August 15	24	2.3	10.3	1.2
	September 6	23	2.1	11.7	1.2
	September 18	21.3	2.2	8.3	1.2
	October 4	20.0	1.9	8.3	0.8
	October 19	15.3	1.4	5.0	0.5
North Point Marina (non-AOC)	July 31	17.3	1.7	11.8	1.0
	August 15	20.3	1.8	11.8	1.1
	September 6	19.5	1.5	12.0	1.0
	September 18	20.5	1.5	12.3	1.5
	October 4	22.3	1.9	10.3	0.9
	October 19	19.8	1.5	9.8	0.9
North Point- Lake	July 31	18	1.6	8.7	1.1
	August 15	25	2.4	9.0	1.2
	September 6	23.7	2.2	10.7	1.3
	September 18	18.3	2.1	9.3	1.5
	October 4	19.3	1.9	7.3	0.9
	October 19	18.3	1.8	8.7	1.0

**APPENDIX D**  
**Waukegan Harbor Citizens Advisory Group Public Comment Submission**



July, 2020

Diane Tecic  
Director  
Coastal Management Program  
Illinois Department of Natural Resources  
160 N. LaSalle Street, Suite S-703  
Chicago, IL 60601

RE: Waukegan Harbor AOC BUI removal

Dear Diane:

The City of Waukegan supports the Illinois Coastal Management Program in its efforts on our behalf to seek the removal of the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment for Waukegan Harbor Area of Concern (AOC).

The City of Waukegan has long sought the revitalization and redevelopment of its lakefront. The steps toward delisting the Waukegan Harbor AOC will help in our efforts toward that end, and give the development community confidence in participating in the achievement of our vision.

Illinois Natural History Survey, which has a long and valuable history of work on Lake Michigan in cooperation with the Coastal Management Program, has shown that this is no longer an impairment.

The City of Waukegan appreciates the support of the Coastal Management Program and the USEPA in removal of this Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment, and the efforts over many years to get Waukegan Harbor clean and delisted. Our partnership is critical to the achievement of our vision, and we are very grateful for your work on Waukegan's behalf.

Sincerely,

Sam Cunningham

Mayor



## *Waukegan Harbor Citizens Advisory Group*

*P.O. Box 297  
Waukegan, Illinois 60079*

July 20, 2020

Colleen Callahan  
Director  
Illinois Department of Natural Resources  
One Natural Resources Way  
Springfield, IL 62702-1271

**Subject: Proposed Removal of the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment from the Waukegan Harbor Area of Concern**

Dear Director Callahan:

The Waukegan Harbor Citizens' Advisory Group is most pleased to support the recommendation of the USEPA and the IDNR – Coastal Zone to delist the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment (BUI) presently actively in place for the Waukegan Harbor Area of Concern (AOC). This becomes the fifth of the six restrictions to be removed from the Waukegan Harbor AOC, and significantly documents we are continuing to make a good recovery.

Citizens have always fished from Government Pier. This federally owned pier provides an easily accessible and affordable opportunity for families to enjoy the fun and challenge of fishing Lake Michigan waters within the safety of the protected harbor. Kayakers are outfitting their kayaks with incredibly complex fishing equipment and enjoying the recently installed ADA canoe/kayak launch to very successfully fish within the safety Waukegan Harbor. Healthier tree swallows continue to harvest the insects hovering over the harbor waters throughout the spring and summer, and to raise their young nearby.

Environmental Justice across the board is reflected by the macroinvertebrates, phytoplankton and zooplankton communities within the harbor sediments rebounding slowly and well. All living organisms up through human beings are greatly benefiting from a cleaned and remediated harbor.

All of the members and affiliates of the Waukegan Harbor Citizens' Advisory Group eagerly look forward to the documented stabilization of the harbor fisheries community, knowing the AOC delisting goal is to achieve parity with the toxicity levels within the Greater Lake Michigan fisheries community.

With our best regards,

Jean B. Schreiber – “Susie”  
Chair

JBS

CC: Diane Tecic, IDNR  
Danielle Nelson, IDNR  
Brad Semel, IDNR

Marc Tuchman, USEPA  
Scott Cieniawski, USEPA  
Kevin Adler, USEPA

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## *Waukegan Harbor Citizens Advisory Group*

*P.O. Box 297  
Waukegan, Illinois 60079*

July 10, 2020

### **Danielle Nelson**

Associate Ecologist/GIS Specialist  
Illinois Sustainable Technology Center  
University of Illinois at Urbana Champaign at  
Illinois Department of Natural Resources – Coastal Management Program  
160 N. LaSalle St. Suite S-703  
Chicago, IL 60601

### **Subject: Proposed Removal of the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment from the Waukegan Harbor Area of Concern**

Dear Danielle,

After very careful review and discussion regarding the draft Beneficial Use Impairment (BUI) document noted above, the Waukegan Harbor Citizens' Advisory Group recommends the following edits highlighted in yellow before finalizing the report:

1. Page 2 – Table of Contents – Table of Figures – Figure 1: Please spell out the corporate name Outboard Marine Corporation instead of using OMC. Not all readers are familiar with the initials OMC. This is a Table of Contents where accurate information is desired quickly.
2. Page 3 – Executive Summary – line 3: Please add in after "...is a commercial and recreational harbor". The harbor has always been open to the public for recreational boating, Government Pier has been open for recreational fishing, and Slip 4 is maintained by Larsen Marine for recreational boating. It might also be noted that Waukegan Harbor is a "harbor of refuge on Lake Michigan" and has been used in recent years as such by ships caught in the massive storms which occur seasonally. In advocating for the cleanup of the Waukegan Harbor Area of Concern, we have always indicated all three harbor uses as each use definitely adds value to the harbor.
3. Page 3 – Executive Summary – line 6: Please make a stronger statement by adding "These chemical contaminants severely impacted, both socially and economically, the health of Waukegan Harbor and the surrounding area. In 1987 the International..."
4. Page 3 – Executive Summary – line 29: Please use "between sites but did demonstrate strong seasonal shifts which differed..."
5. Page 3 – Executive Summary – line 33: Please restructure to read "...a lack of water toxicity throughout the AOC. Therefore, based on the above findings, the Illinois Department of Natural..."
6. Page 4 – Geographic Extent and Area of Concern Boundary – line 15: "...in the 1840's. Waukegan Harbor is a deep-draft commercial, recreational and Harbor of Refuge ~~harbor~~ ranging in depth from..."
7. Page 4 – Geographic Extent and Area of Concern Boundary – line 19: "With the exception of the recreational boat launching..."

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## *Waukegan Harbor Citizens Advisory Group*

*P.O. Box 297  
Waukegan, Illinois 60079*

8. Page 5 – Geographic Extent and Area of Concern Boundary – Please add label in white: Inner Harbor Extension. This is very important when following all of the issues related to cleanup and funding. See attached map clearly identifying the sections of the Federal Channel in Waukegan Harbor.
9. Page 6 – Geographic Extent and Area of Concern Boundary – Please add in the missing red star locator for the ongoing North Shore Gas Superfund South Unit. See attached map identifying the current North Shore Gas major cleanup actions on Pershing Rd. just opposite the entrance to the Pershing Road Waukegan Port District offices and Recreational Harbor south of Government Pier.
10. Page 7 – Overview of Waukegan Harbor AOC – line 4: “The identified BUI’s for the Waukegan Harbor AOC are:”
11. Page 9 – last line at the bottom of the page: all management actions for the AOC were completed for the harbor sediment. In the spring of 2014 the final PCB’s were removed from the west end of OMC Plant 2, thereby fulfilling all of the management actions for the Waukegan Harbor AOC related to PCB contamination.
12. Page 11 - Supporting Data and Assessment – Figure 3 – based on your red marker dots, WH 3 is located in the Inner Harbor Extension; WH4 is located in the Inner Harbor, not in the Recreational Launch area. These are very important distinctions and need to be addressed so that all testing sites match previously completed maps of test sites done between 1998 and 2010.
13. Page 16 – Public Comment – The Waukegan Harbor Citizens’ Advisory Group (CAG) has been guiding the cleanup process in Waukegan Harbor, the Area of Concern and the Extended Area of Concern since August of 1990. For the first fifteen years the Illinois Environmental Protection Agency was the lead state agency and the US Army Corps of Engineers was the Federal partner agency on the ground working in partnership with the Waukegan Harbor CAG. The USEPA stepped in far more actively at the local level in the early 2000’s and continues their strong involvement today. In late 2011 the Illinois Department of Natural Resources took over the state helm from the Illinois EPA and has been directing the BUI removals, and the testing of the harbor sediments and fish as part of the required federal cleanup process.

The Waukegan Harbor CAG is made up of local businesses and corporations; municipal bodies; local, regional, state, and federal environmental agencies; and educational, fisheries and environmental organizations. It meets once a month (except during COVID-19) to discuss and coordinate the environmental issues in the AOC and ESA and has provided strong leadership in the harbor cleanup efforts.

The Waukegan Harbor CAG regularly coordinates with regional AOC and lake wide stakeholders, private citizens, local, state and national environmental and educational organizations, and corporations to disseminate information about the Waukegan AOC history, cleanup and restoration efforts, and the status of the current remediation. Engagement in public outreach has been via presentations at meetings and conferences; in providing many on-site site tours of current work; work in Waukegan-area schools helping students put on Waukegan environmental conferences; and in bringing the W.G. Jackson research ship from

***DREDGE      DEEPEN      DELIST***



## *Waukegan Harbor Citizens Advisory Group*

*P.O. Box 297  
Waukegan, Illinois 60079*

Grand Valley State University in Muskegon, Michigan to Waukegan Harbor for hands on real time citizen science to familiarize the public, and local and state representatives, with the AOC's history and remediation status, and to introduce kids children and adults to the science of the Great Lakes.

Representatives of state and federal agencies attend monthly CAG meetings to report on cleanup and monitoring progress and to gather input from attendees. The IDNR and the Illinois Natural History Survey (INHS) have presented updates and the study results related to the Degradation of Phytoplankton and Zooplankton Populations BUI at previous CAG meetings. and IDNR will continue to work with the Waukegan Harbor Citizens' Advisory Group CAG during the public comment period for this BUI removal document.

As has been stated many times, it is very important to make sure all the facts and data are accurately reflected. The material in the USEPA Waukegan Harbor Document Repository continues to be utilized by researchers, historians, developers, students and teachers, and members of the scientific and legal communities. We look forward to working closely with you to complete your FINAL DRAFT of the Proposed Removal of the Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment from the Waukegan Harbor Area of Concern document.

Respectfully submitted,

Jean B. Schreiber – "Susie"  
Chair  
Waukegan Harbor Citizens' Advisory Group

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***DREDGE      DEEPEN      DELIST***