



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

September 3, 2020

REPLY TO THE ATTENTION OF:
S-6J

MEMORANDUM

SUBJECT: ENFORCEMENT ACTION MEMORANDUM – Request for Approval of Action Memorandum for Non-Time Critical Removal Action at Middleground Island of the Tittabawassee River, Saginaw River & Bay Site, Michigan (Site ID #B5KF)

FROM: Mary P. Logan, Remedial Project Manager

THRU: Nefertiti DiCosmo, Chief
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TO: Douglas Ballotti, Director
Superfund & Emergency Management Division

I. PURPOSE

The purpose of this memorandum is to request approval of this Action Memorandum for a non-time critical removal action (NTCRA) to address contaminated soil in residential yards at Middleground Island (MGI) of the Tittabawassee River, Saginaw River & Bay Site, Michigan (Site). The general location of MGI is depicted in Attachment A to this Action Memorandum.

This NTCRA will mitigate actual or potential threats to public health, welfare, or the environment presented by the presence of an uncontrolled release or threat of release of hazardous substances, pollutants, or contaminants, as identified by the presence of elevated levels of polychlorinated dibenzo-p-dioxins (dioxins) and/or polychlorinated dibenzofurans (furans) in soil in residential yards on MGI. More specifically, soil at MGI poses a risk due to actual or potential exposure to nearby human populations from hazardous substances or

pollutants or contaminants. Another factor that may be applicable is high levels of hazardous substances or pollutants or contaminants in the Middleground Island floodplain soil largely at or near the surface that may migrate. Hazardous substances or pollutants or contaminants have or may have come to be located on MGI from The Dow Chemical Company (Dow) Midland Plant property, with an address of 1000 East Main Street, 1790 Building, Midland, Michigan, 48667.

Work under this Action Memorandum will generally occur at specific residential properties on MGI and nearby areas within the Site. Soil at some residential properties on MGI contain elevated levels of dioxin (primarily furans). The term “dioxin” refers to a large family of similar chemicals, including furans. The United States Environmental Protection Agency (U.S. EPA) has concluded that dioxin may cause cancer or other human health effects such as skin problems, liver damage, and reproductive issues, depending on exposures. Dioxin is not created intentionally; in this case, dioxin formed as a byproduct of Dow’s early manufacturing processes. This Action Memorandum discusses dioxin concentrations as the toxic equivalence quotient (TEQ) – a summed estimate of the relative toxicity of the congeners as compared to 2,3,7,8-tetrachlorodibenzo-p-dioxin.

The proposed response actions include removing contaminated soil in people’s yards, replacing it with clean soil, and restoring grasses and plants. Eligible residential properties are those where soil tests show dioxin levels greater than the site-specific residential cleanup number of 250 parts per trillion parts (ppt) TEQ.

U.S. EPA and Dow have agreed to enter into an Administrative Settlement Agreement and Order on Consent (MGI AOC), pursuant to which Dow will perform the removal action described herein with U.S. EPA oversight.

This action will be conducted in accordance with Section 104(a)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9604(a)(1), and 40 C.F.R. § 300.415 (*Removal Action*) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to abate or eliminate the threats posed to public health and/or the environment. U.S. EPA has consulted, and will continue to consult with, the Michigan Department of Environment, Great Lakes, and Energy (EGLE)¹ on MGI response actions. This action is anticipated to require one construction season to implement and is expected to begin in 2021. This action will be implemented by Dow, the potentially responsible party, under a CERCLA Section 106/122 agreement. As such, pursuant to NCP Section 300.415(k)(3), the requirements to terminate response after \$2 million has been obligated or 12 months have elapsed from the date of the initial response do not apply.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID#: MID980994354

Category: Non-Time Critical Removal Action

¹ Formerly Michigan Department of Environmental Quality or MDEQ.

A. Physical Location and Description

The Tittabawassee River, Saginaw River & Bay Site starts at the confluence of the Tittabawassee and Chippewa Rivers at Midland, MI. The Site is defined in the Administrative Settlement Agreement and Order on Consent for Remedial Investigation, Feasibility Study and/or Engineering Evaluation and Cost Analysis, and Response Design, entered In The Matter of: The Dow Chemical Company, CERCLA Docket No. V-W-10-C-942, with an effective date of January 21, 2010 (2010 AOC). The Site is the area located in and along the lower 24 miles of the Tittabawassee River and its floodplains, starting upstream of Dow's Midland Plant, and extending downstream to, and including, the 22-mile Saginaw River and its floodplains, and Saginaw Bay; and any other areas in or proximate to the Tittabawassee River and its floodplains, the Saginaw River and its floodplains, and Saginaw Bay, where hazardous substances, pollutants, or contaminants from the Midland Plant have or may have come to be located. The Site is being addressed in a general upstream to downstream approach.

Middleground Island is in the Saginaw River approximately seven miles upstream (south) of Saginaw Bay (see Attachment A). About 41 acres of the 175-acre island consists of residential properties or properties that could become residential. The remainder includes recreational, commercial, and closed waste disposal properties. In the 1950s, a few residential homes began to appear on the southern point of MGI. Development of additional homes continued during the next few decades and currently there are 37 residential homes on the island. Current land use on MGI is depicted in Attachment B. Human access to the Site is available to people living at privately owned properties or visiting the island. Wildlife in the area also has access to the Site.

B. Background

The Midland Plant began operations in 1897 and eventually grew to be a 1,900 acre facility. Over the time of its operation, the Midland Plant has produced over 1,000 different organic and inorganic chemicals. Early in the history of the Midland Plant, wastes were discharged directly into the Tittabawassee River and, later, wastes were stored and partially treated in settling ponds prior to discharge to the River. One major historical process used at the Midland Plant was the chloralkali process, which used electric current to extract chemicals from brine. Much of the TEQ throughout the Site is believed to have been released in the early 1900s in the form of furan-contaminated graphitic particles that came from breakdown of the carbon anodes used in the chloralkali process. The furan contamination was unknown at that time and was formed as a byproduct of the process. Once released to the Tittabawassee River, the graphitic waste particles moved downstream with the bedload and mixed with Saginaw River sediment. Current waste management practices, including the wastewater treatment plant and groundwater and surface water control, have reduced or eliminated non-permitted releases from Dow's Midland plant.

Historically, Middleground Island was primarily wetlands until the island was developed for more industrial use by logging and salt industries in the 1800s and early 1900s. Starting around the turn of the twentieth century, Middleground Island was used for both controlled and uncontrolled landfilling and dumping of waste materials including construction debris, brush,

and river dredge material. The more well-documented disposal sites on the island were operated by the City of Bay City in the central portion of the island along the western bank. Bay City Middleground Landfill operated from 1956 until 1984 when the State ordered this landfill closed. It was proposed to the National Priorities List (NPL) in 1995 but addressed under the State's remediation program.

The dioxins found in Middleground Island soil are believed to be from the historical use of dredge materials as fill on the island. In 1910, the Saginaw River became an authorized federal navigation channel. Regular dredging in the Saginaw River has been conducted over time by the U.S. Army Corps of Engineers (Corps). The Corps created the Middleground confined disposal facility (CDF) and used it as a disposal location for Saginaw River dredge material from 1973 until 1984. Dredged sediment from the CDF was used as daily cover material at the adjacent Bay City Middleground Landfill. Reportedly, the dredged sediment was also available for use as fill material in island yards.

Dioxins and furans are listed as hazardous constituents in Appendix VIII to Part 261 of Title 40 of the Code of Federal Regulations, 40 C.F.R. Part 261 app. VIII, and Part 111 of Natural Resources and Environmental Protection Act (NREPA), Mich. Comp. Laws §§ 324.11101-324.11153, and as hazardous substances in Part 201 of NREPA, Mich. Comp. Laws §§ 324.20101-324.20142.

The former MDEQ, now EGLE, reissued to Dow its current RCRA Hazardous Waste Management Facility Operating License for the Midland Plant, with an effective date of September 25, 2015 (License). Under its License, and the previous licenses, Dow has been conducting corrective action work including characterization of the Tittabawassee River. Dow continues to conduct corrective action work under the License on the plant site and off-site in the City of Midland. Corrective action work also is identified in the January 19, 2005, Framework for an Agreement between the State of Michigan and the Dow Chemical Company. Under work previously conducted under the RCRA License, primary source control has been completed.

U.S. EPA's and EGLE's understanding of potential hazardous substances in MGI soil is based on various sampling, analysis, and studies regarding dioxin/furans and other contaminants in the Tittabawassee River, the Saginaw River, and the Saginaw Bay. The sampling, analysis, studies, and orders relied on by U.S. EPA and EGLE include, but are not limited to, those listed in the Administrative Record index found in Attachment C.

In December 2008, negotiations with Dow began for a comprehensive approach to addressing contamination related to Dow in the rivers and Bay. On January 14, 2010, using CERCLA authority, U.S. EPA signed the 2010 AOC with the MDEQ and Dow, requiring Dow to perform investigations, and develop and design cleanup options selected by U.S. EPA for areas such as MGI, and other areas. The 2010 AOC became effective on January 21, 2010, and work under the 2010 AOC is ongoing.

The 2010 AOC established a comprehensive site-wide management approach for the Site. This approach includes developing a set of prioritized actions (including this MGI NTCRA) intended to reduce exposure to and transport of contaminated sediment, riverbanks and floodplain soil to reduce risks to human health and ecological receptors. Work under the 2010 AOC has generally been upstream-to-downstream, segment-by-segment, starting adjacent to Dow's Midland Plant to control potential secondary sources in sediment and bank deposits.

Mitigation of potential human exposure to Site contaminants is a key element of the site-wide management approach because completion of all assessment and remediation is expected to take several years. Interim exposure controls (including at MGI) have been provided ahead of cleanups. Cleanup of the Tittabawassee River floodplain is being addressed separately and in parallel with the Tittabawassee River segments, pursuant to a 2015 floodplain NTCRA. This MGI Action Memorandum will control potential unacceptable human exposures to dioxin contamination in MGI soil.

C. Environmental Justice Analysis

An Environmental Justice (EJ) analysis for MGI of the Site is contained in Attachment D. Screening of the surrounding area used U.S. EPA's EJSCREEN Tool (see <https://www.epa.gov/ejscreen>). Region 5 reviewed environmental and demographic data for the residential area on MGI and determined there is a potential for EJ concerns at this location.

D. Risk Assessments, Cleanup Numbers, Health Consultations, and Advisories

1. Risk Assessments

The 2010 AOC and associated Statement of Work (2010 SOW) set forth requirements that Dow conduct human health and ecological risk assessments. Dow has not yet completed those risk assessments but will conduct them in accordance with the requirements of the 2010 SOW. Specifically, the 2010 SOW directs Dow to conduct residual risk assessments after substantial implementation of response actions. U.S. EPA, EGLE, and Dow initiated a Human Health Risk Assessment (HHRA) in 2018 that will assess residual dioxin/furan risk in all seven of the Tittabawassee River segments and the adjacent floodplains. Based on the results of that HHRA and ongoing monitoring, U.S. EPA, in consultation with EGLE, will assess whether additional response actions may be needed under CERCLA. Subsequently, a final Record of Decision(s) will be issued.

The MGI EE/CA presented detailed information obtained during a series of site investigations conducted by Dow and others. A brief summary of the findings is included in Section II.E, below. These investigations largely focused on dioxins and furans. The MGI EE/CA summarizes the nature and extent of TEQ in soil and evaluates the bases for response actions resulting from potential human direct contact exposure to MGI soil. A risk assessment was not conducted as part of the MGI EE/CA. Rather, MGI soil results were compared to U.S. EPA's site-specific health-based Cleanup Numbers discussed below. Seventeen of the 45 residential

sampling units (SUs) had dioxin levels exceeding 250 ppt TEQ, with a maximum of 1,290 ppt TEQ. This represents about 15 acres of the 175-acre island.

2. Site-Specific Dioxin TEQ Cleanup Numbers

In 2014, U.S. EPA, working with EGLE, established site-specific human direct contact dioxin criteria for floodplain soil (Cleanup Numbers). The Cleanup Number for maintained residential properties is 250 ppt TEQ. The Cleanup Number for all other land uses is 2,000 ppt TEQ. The Cleanup Numbers are based on site-specific data on climate, exposure to house dust vs. soil, and bioavailability. The numbers are based on potential non-cancer effects for the most sensitive receptor – the young child resident (i.e., a Hazard Index of approximately 1). The Cleanup Numbers also fall within acceptable cancer risk ranges.

Information regarding prenatal and postnatal health effects attributed to dioxin exposure and changes in risk assessment practices resulted in the necessity to more closely consider the potential for non-cancer adverse effects in developing dioxin Preliminary Remediation Goals (PRGs). Based on this information, U.S. EPA developed a dioxin oral Reference Dose (RfD) of $7.0E-10$ mg/kg-day that was finalized in February 2012. This RfD and U.S. EPA non-adjusted (default) exposure factors were used to calculate screening values that can be found in U.S. EPA's Regional Screening Levels – Generic Tables. U.S. EPA has an expectation that the Regions often will prefer site-specific data that can be used to adjust these values using site-specific exposure factors instead of the default exposure factors.

Because site-specific exposure data was available, U.S. EPA and EGLE calculated site-specific dioxin PRGs for a variety of human direct contact floodplain soil exposure scenarios. The calculations followed standard U.S. EPA and EGLE algorithms and used a combination of both standard default and site-specific input parameters. Potential PRGs were calculated to assess both non-cancer risks to meet a Hazard Quotient of 1 and cancer risks to meet U.S. EPA and EGLE risk ranges. Based on these calculations, U.S. EPA and EGLE proposed two site-specific human direct contact PRGs for floodplain soil: 250 ppt TEQ for maintained residential areas; and 2,000 ppt TEQ for other land use areas. The site-specific PRGs are based on the most sensitive receptor and direct contact exposure scenario within each land use, in both cases the young child resident. Thus, the PRGs are protective for all other human direct contact receptors and exposure scenarios. The PRG development, including a detailed discussion of site-specific exposure factors, is presented in U.S. EPA's technical document Site-Specific Preliminary Remediation Goals (Cleanup Goals) For Tittabawassee River Floodplain Soil.

U.S. EPA took public comment on a proposed cleanup plan for the Tittabawassee Floodplain, including the site-specific PRGs. U.S. EPA responded to comments on the PRGs in the Responsiveness Summary of the Tittabawassee River Floodplain Action Memorandum, dated January 8, 2015. In that Action Memorandum, U.S. EPA, in consultation with EGLE, finalized the PRGs of 250 ppt TEQ for maintained residential areas and 2,000 ppt TEQ for other land use areas as the site-specific numeric TEQ Cleanup Numbers for human direct contact with floodplain soil.

3. Health Consultations

EPA and EGLE work with health agencies such as the Agency for Toxic Substances and Disease Registry (ATSDR) and the Michigan Department of Health and Human Services (MDHHS, formerly Michigan Department of Community Health) to understand potential health effects to people from environmental contamination. ATSDR and MDHHS completed a number of health consultations for the Tittabawassee River, Saginaw River & Bay Site (found at <http://www.atsdr.cdc.gov/HAC/PHA/HCPHA.asp?State=MI>), including:

- 8/12/04 Health Consultation, Tittabawassee River Floodplain Dioxin Contamination, Tittabawassee River, Midland, Midland County, Michigan
- 4/29/05 Petitioned Health Consultation, Dioxins in Wild Game Taken from the Tittabawassee River Floodplain South of Midland, Midland and Saginaw Counties, Michigan
- 7/27/05 Tittabawassee River Fish Consumption Health Consultation, Tittabawassee River, Midland, Midland County, Michigan
- 11/1/07 A Pilot Exposure Investigation Report: Dioxin Exposure in Adults Living in the Tittabawassee River Floodplain
- 2/4/08 Health Consultation, Evaluation of Saginaw River Dioxin Exposures and Health Risks, Saginaw River, City of Saginaw, Saginaw County, Michigan
- 8/19/09 Health Consultation, Dioxin Contamination on Residential Property in the Tittabawassee River Floodplain, Saginaw County, Michigan

4. Advisories

The State of Michigan has issued fish consumption advisories for dioxins, PCBs, and mercury for the Tittabawassee and Saginaw Rivers and Saginaw Bay. Mercury is not Site related. These advisories are posted at multiple locations throughout the watershed. The advisories can be found online at

https://www.michigan.gov/documents/mdch/EAT_SAFE_FISH_IN_THE_SAGINAW_BAY_AREA_WEB_35692_9_7.pdf

The State of Michigan has issued the advisory “Eat Safe Wild Game from the Saginaw Bay Area” for the Saginaw and Tittabawassee River floodplains due to dioxin contamination. The wild game advisory can be found online at

http://www.michigan.gov/documents/mdch/Eat_Safe_Wild_Game_277942_7.pdf

The State of Michigan’s latest advisories are summarized in *Dioxins and Furans and Your Health along the Tittabawassee and Saginaw Rivers*. This brochure is found at

http://www.michigan.gov/documents/mdch/Dioxin_Exposure_and_Health_Final_420292_7.pdf

E. Site Assessments

The Administrative Records for the Site contains numerous reports which summarize the investigations conducted at the Tittabawassee River, Saginaw River & Bay Site to date. The Administrative Record Index for MGI is provided in Attachment C.

The lower Saginaw River floodplain characteristics, commercialization, topography, and flooding patterns and frequency are significantly different than those of the Tittabawassee River. The Current Conditions Report for the Saginaw River, Floodplain, and Bay, June 2008 (CCR), summarized existing floodplain sampling that had been conducted in the Lower Saginaw River by the State, the U.S. Army Corps of Engineers, and Dow between 1998 and 2008. The results reported in the CCR provided an overall representation of the dioxin and furan concentration range within the Saginaw River floodplain, which were substantially lower than levels in the Tittabawassee River floodplain.

Supplemental focused sampling and analysis has been performed under the 2010 SOW to characterize soil on MGI. In particular, the MGI EE/CA summarizes conditions. To provide an up-to-date screening of Saginaw River floodplain conditions Dow took incremental composite samples from soil in several areas along the Saginaw River in November 2018, including three samples from the residential (south) end of MGI. All three of the MGI samples had dioxin levels higher than U.S. EPA's residential Cleanup Number of 250 ppt TEQ.

In 2019 Dow took soil samples from many sampling units (SUs) on MGI. Most of the SUs were at residences or properties that are not currently residential but could be in the future. Seventeen of the 45 residential SUs had dioxin levels exceeding 250 ppt, with the maximum of 1,290 ppt TEQ. Property owners eligible for cleanup have been contacted by EPA. Interim exposure controls were offered and implemented at some residential properties in 2019. Dow also sampled the recreational areas at the north end of the island and some commercial properties in the center of the island. None of the other land use SUs exceeded U.S. EPA's other land use Cleanup Number of 2,000 ppt TEQ. Therefore, EPA's cleanup plan is focused on the residential areas. The 2018 and 2019 soil sampling documents that soil in some residential areas on MGI exceeds U.S. EPA's residential Cleanup Number. In total, about 15 acres are expected to be cleaned up. This amounts to about 35,000 in-place cubic yards or about 46,000 cubic yards of contaminated soil to truck off-site.

F. NPL Listing Status

Neither the Tittabawassee River, Saginaw River & Bay Site nor MGI are listed on the NPL. U.S. EPA is addressing the Tittabawassee River, Saginaw River & Bay Site under the Superfund Alternative (SA) approach, which uses the same investigation and cleanup process and standards for sites listed on the NPL. The SA approach is an alternative to listing a site on the NPL; it is not an alternative to Superfund or the Superfund process. Threshold eligibility criteria for using the SA approach are: site contaminants are significant enough that the site would be eligible for listing on the NPL (*i.e.*, the site would have a Hazard Ranking Score ≥ 28.5); a long-term response (*i.e.*, a remedial action) is anticipated at the site; and there is a willing, capable PRP who will negotiate and sign an agreement with EPA to perform the investigation and cleanup.

G. Maps, Pictures and Other Graphic Representations

A figure showing the general location of MGI is included as Attachment A to this Action Memorandum. A figure showing the current land use on MGI is included in Attachment B.

H. Other Actions to Date

1. Previous CERCLA Actions at Tittabawassee River, Saginaw River & Bay Site

In order to implement response actions at the Tittabawassee River, Saginaw River & Bay Site, U.S. EPA and Dow have entered into numerous separate AOCs under the authority of Sections 104, 106(a), 107, and 122 of CERCLA.

- a. On July 12, 2007, U.S. EPA and Dow entered into an AOC for a CERCLA time critical removal to dredge and dispose of a sediment deposit at Reach D adjacent to Dow's Midland plant. U.S. EPA provided Dow with notification of the completion of this AOC on October 15, 2008.
- b. On July 12, 2007, U.S. EPA and Dow entered into an AOC for a CERCLA time critical removal at Reaches J/K to remove and dispose of contaminated riverbank soil, cap a contaminated upland area, and fence off a contaminated wetland area. U.S. EPA provided Dow with notification of the completion of this AOC on May 2, 2008.
- c. On July 12, 2007, U.S. EPA and Dow entered into an AOC for a CERCLA time critical removal to dredge and dispose of a sediment deposit at Reach O. U.S. EPA provided Dow with notification of the completion of this AOC on April 10, 2008.
- d. On November 15, 2007, U.S. EPA and Dow entered into an AOC for a CERCLA time critical removal to dredge and dispose of a sediment deposit near Wickes Park in the Saginaw River. U.S. EPA provided Dow with notification of the completion of this AOC on August 4, 2008.
- e. On July 15, 2008, U.S. EPA and Dow entered into an AOC for a CERCLA time critical removal to remove and dispose of floodplain soil around residential properties at Riverside Boulevard and clean the inside of occupied homes. U.S. EPA provided Dow with notification of the completion of this AOC on February 1, 2010.
- f. On February 27, 2009, U.S. EPA and Dow entered into an AOC for a CERCLA time critical removal to remove and dispose of floodplain soil at West Michigan Park and conduct soil removal and/or barrier controls at adjacent residential properties. U.S. EPA provided Dow with notification of the completion of this AOC on September 11, 2012.

- g. On May 26, 2011, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to provide interim exposure controls at eligible floodplain properties. The work under this AOC is ongoing.
- h. On July 8, 2011, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to remove a small eroding island and cap adjacent sediment in Reach MM. U.S. EPA provided Dow with notification of the completion of this AOC on July 12, 2012.
- i. On November 1, 2011, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to remove and destroy dense non-aqueous phase liquids from the Tittabawassee River and install hydraulic control barriers and caps at SMAs in Segment 1. U.S. EPA provided Dow with notification of the completion of this AOC on September 27, 2017.
- j. On November 21, 2013, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to address SMAs and BMAs within Segment 2. U.S. EPA provided Dow with notification of the completion of this AOC on September 6, 2019.
- k. On January 8, 2015, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to address soil contaminated with dioxins and furans within the Tittabawassee River 8-year floodplain of the Tittabawassee River, Saginaw River & Bay site. The work under this AOC is ongoing.
- l. On February 25, 2016, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to address SMAs and BMAs within Segment 3. U.S. EPA provided Dow with notification of the completion of this AOC on October 3, 2019.
- m. On February 8, 2017, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to address SMAs and BMAs within Segments 4 & 5. The work under this AOC is ongoing.
- n. On May 21, 2019, U.S. EPA and Dow entered into an AOC for a CERCLA non-time critical removal action to address SMAs and BMAs within Segments 6 & 7. The work under this AOC is ongoing.

The AOCs listed above in g, k, m, and n are current actions and are further described in Section II.H.3 below.

2. Previous Actions at Middleground Island

There have been no previous CERCLA response actions at the residential area on MGI. U.S. EPA proposed the Bay City Middleground Landfill to the NPL in 1995 but site was not finalized on the NPL and the landfill is being addressed under the State's remediation program.

3. Current Actions

Dow, under U.S. EPA and MDEQ oversight, is addressing potential acute or near-term exposure risks at eligible properties in the floodplain through interim exposure controls pursuant to the May 26, 2011, AOC. Dow placed interim exposure controls at many floodplain properties, primarily in 2011 and 2012. As the floodplain work discussed below (January 8, 2015, AOC) is being implemented, the need for interim exposure controls at eligible properties is being superseded. However, this AOC remains open until floodplain obligations are met.

Response options are generally developed and implemented in an upstream-to-downstream, segment-by-segment fashion for in-channel sediment and riverbanks. Pursuant to the February 8, 2017 AOC, Dow started cleanup of SMAs and BMAs in Segments 4 & 5 in 2017, with construction largely complete in 2019. Pursuant to the May 21, 2019 AOC, Dow started cleanup of SMAs and BMAs in Segments 6 & 7 in 2019 and work is expected to be largely complete in 2021. The work required by these NTCRAs is ongoing, ensuring the native vegetation planted on the BMAs is well established, and post-removal site controls are developed and implemented.

Dow, with oversight by U.S. EPA and MDEQ, is cleaning up dioxin-contaminated soil in frequently flooded areas along the Tittabawassee River pursuant to the January 8, 2015, AOC. The eight-year floodplain includes about 4,500 acres and extends along 21 miles of the river below Dow's Midland plant. Not all areas in the floodplain will need a cleanup. U.S. EPA is assessing more than 700 properties to determine if a cleanup is needed and the most appropriate approach at eligible properties. Dow began cleanup of the first floodplain properties in the summer of 2015, and floodplain cleanup is an ongoing, multi-year project.

I. State and Local Authorities' Role

1. State and Local Actions to Date

Dow's current License for the Midland Plant was reissued by EGLE with an effective date of September 25, 2015. Under its License and the January 19, 2005, Framework for an Agreement between the State of Michigan and The Dow Chemical Company, Dow conducted corrective action work including limited characterization of the Saginaw River and Bay. U.S. EPA has partnered with EGLE, as described under the 2010 AOC, to continue to undertake CERCLA activities at the Tittabawassee River, Saginaw River & Bay Site. The CERCLA actions are intended to also meet Dow's RCRA corrective action requirements for the Tittabawassee River, Saginaw River & Bay Site.

For MGI U.S. EPA and EGLE have consulted extensively with MDHHS and local health departments. The health departments have participated in U.S. EPA meetings and provide advice to the public. The residential area on MGI is generally within Frankenlust Township jurisdiction. The remainder of MGI, including most of Evergreen Drive, is within the City of Bay City. Before the public comment period started, U.S. EPA, EGLE, and/or Dow communicated to these entities about the proposed response actions, the potential impacts to

MGI properties, and their right to provide public comment. The City of Bay City, Frankenlust Township, and the Bay County Road Commission provided comments that are summarized and responded to in the Responsiveness Summary found at Attachment E. U.S. EPA, EGLE, and Dow will continue to work with these local entities as the cleanup progresses.

2. Potential for Continued State/Local Response

U.S. EPA anticipates a continuing partnership with EGLE as outlined in the 2010 AOC. U.S. EPA, EGLE, and Dow will continue to work closely with the health departments and local entities as the response actions are designed and implemented.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The conditions present at Middleground Island constitute a threat to public health, welfare, or the environment based upon the factors set forth in the NCP, 40 C.F.R. § 300.415(b)(2). These factors include, but are not limited to, the following:

A. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants.

This factor is present at the Site due to the existence of MGI surface soil contaminated with dioxins/furans at levels that may contribute to unacceptable risks in humans from direct contact exposure (i.e., inadvertent ingestion and dermal absorption).

B. High levels of hazardous substances or pollutants or contaminants in MGI floodplain soil largely at or near the surface that may migrate.

This factor is present at the Site due to the existence of elevated TEQ in some surface soil samples taken from 0 – 6 inches below ground surface. The Site is subject to periodic flooding.

IV. ENDANGERMENT DETERMINATION

Given the conditions at Middleground Island, the nature of the hazardous substance there, and the potential exposure pathways described above, the actual or threatened release of contaminants from Middleground Island, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED REMOVAL ACTION ACTIVITIES AND ESTIMATED COSTS

A. Proposed Removal Action Activities

1. Proposed Removal Action Description

The required response actions at MGI will, at a minimum, include the following tasks (collectively, the Work):

- Develop and implement a Work Plan. The actions described in the approved Work Plan and all approved designs shall include, but are not limited to, the following:
 - Conduct pre-removal field investigations to document pre-construction conditions on Evergreen Drive, each property that will undergo cleanup, temporary staging areas, and access and traffic routes. This documentation will be used to compare pre- and post-construction conditions.
 - Develop temporary staging areas and access to the Site to meet project requirements. Such areas may include, but are not limited to, soil staging, equipment storage and decontamination, mobilization/demobilization, worker access, and exclusion zones.
 - Attempt to gain access to sample properties MG_45-46 and MG_56. If access is provided, provide an addendum to the MGI sampling plan. Once approved, sample in accordance with the MGI sampling plan addendum. If soil exceeds 250 ppt TEQ the property will be eligible for cleanup.
 - For each eligible property, develop a property-specific design, after an opportunity for input from each property owner. The removal action activities developed in each property-specific design shall consist of: document pre-construction conditions; clear and prepare the area; excavate soil to the design depth; place a marker layer (if needed); backfill excavated areas with clean fill and/or topsoil to the design grade (generally the original grade, with topsoil as the surface lift); and restore the property per the property-specific design. Eligible properties currently include: MG_12-13; MG_14-15; MG_16-17; MG_18; MG_20-22; MG_29; MG_31; MG_32; MG_33; MG_38; MG_39; MG_41-42; MG_44; MG_50; and MG_52-55.
 - Obtain access agreements and implement the Work at each property parcel in accordance with the approved property-specific design and approved schedule.
 - Develop and implement a Traffic Management Plan.
 - Conduct monitoring during the construction phase of the Work in accordance with the Work Plan.
 - Transport and dispose of all soil, waste, and materials removed from the Site as a result of implementing the Work at approved locations in accordance with the Work Plan
 - Remove and restore the temporary access, mobilization, and staging areas.

- Develop a Restoration Plan and implement it for a minimum of two years, or as otherwise approved by the U.S. EPA RPM/OSC.
- Document completion of the Work at each property in accordance with the Work Plan.
- Develop and implement a Site Health and Safety Plan.
- Submit Progress Reports and a Final Report.

2. Contribution to Remedial Performance

The removal action implemented at MGI will address actual or potential short-term and/or long-term risks by reducing exposure to and/or transport of contaminated soil. In accordance with Section 300.415(d) of the NCP, U.S. EPA expects that this removal action shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned.

3. Analysis of Selected Response Actions

U.S. EPA selected the proposed response actions in this NTCRA based on careful consideration of information in the Administrative Record, including the EE/CA Approval Memorandum, the MGI EE/CA, public comments as evaluated in the Responsiveness Summary found at Attachment E, and other information in the Administrative Record.

U.S. EPA guidance establishes criteria for the evaluation of removal responses. Therefore, U.S. EPA evaluated the response actions in this NTCRA relative to effectiveness, implementability, and cost. Additionally, as required by the 2010 AOC, the MGI EE/CA further evaluated the potential response alternatives against the nine evaluation criteria established for remedial responses in Section 300.430(e)(9)(iii) of the NCP. The discussion below highlights the most relevant criteria in distinguishing between alternatives. U.S. EPA evaluated two technologies to clean up MGI yards: clean cover and removal and backfill. U.S. EPA, in consultation with EGLE, has selected the removal responses discussed above because this option provides the best balance of the evaluation criteria.

Effectiveness: The selected alternative, removal and backfill, is expected to help protect human health and the environment, meet the Cleanup Numbers, and comply with laws and regulations. The property-specific design of each eligible property will consider unique conditions, if any. The response actions contribute to effectiveness because:

- Both alternatives can be effective in the short term. Clean covers provide an immediate benefit by safely isolating the contamination. Once the soil is dug up and replaced, removal also provides an immediate benefit.

- Both alternatives would have short-term impacts such as limitations on property use, heavy equipment around properties, and noise that may be disruptive during the cleanup. If possible, these effects would be managed by construction practices and working with property owners. It's usually faster to install clean covers than to dig up and replace soil.
- Both alternatives would require most existing vegetation to be cleared away. Although yards will be replanted, mature trees and landscaped areas may need to be removed. Grassy areas will be easier to restore.
- Both alternatives are expected to result in truck traffic through the communities and potential traffic safety issues. There would also be air emissions from the transport.
 - Clean covers could require about 750 truckloads to deliver the cover materials.
 - Removal could require more than 1100 truckloads to haul away the contaminated soil and about 1100 truckloads to bring in clean replacement soil.
 - Trucks will travel more than 20 miles one-way to haul removed contaminated soil to an off-island location.
- Worker safety concerns involve working around and operating construction equipment, managing large amounts of contaminated soil and possible exposure to extreme weather conditions. These concerns would be managed by appropriate health and safety plans.
- Clean covers may be less reliable in the long-term because integrity of the cover relies on compliance of individual property owners with long-term land use restrictions. Covers must be monitored and may need maintenance to make sure they continue to be reliable. Removal would be effective in the long term because it permanently removes contaminated soil from yards.

Implementability: Either alternative can be carried out. Dow has successfully implemented similar actions at other areas in the Tittabawassee River floodplain. All equipment, personnel and material necessary to implement the alternatives should be locally available. The affected property owners generally seem to accept the proposal but are interested in potential impacts to the community (see Responsiveness Summary at Attachment E). EGLE supports U.S. EPA's recommended alternative. Some implementability concerns are:

- Traffic management will be one of the biggest implementation challenges. The only vehicle access to the island is via a busy two-lane road with two bridges. There are currently no traffic controls to turn on or off the island. On the island there is only one narrow, two-lane road (Evergreen Drive). Remedy-related construction traffic on the island will need to be carefully planned and managed.

- Agreements from owners must be obtained before conducting work on their property. Long-term agreements and institutional controls would be requested of property owners if a clean cover is placed and some owners may be reluctant to allow ongoing access or to place institutional controls.
- In order to approve the final location for long-term management of removed soils, U.S. EPA and EGLE need to ensure that the site meets all technical and legal requirements and that the owners and operators can provide the necessary long-term assurances.

Cost: The total estimated cost for the selected alternative, removal and backfill is estimated to be between \$1,700,000 and \$2,000,000. The cost range reflects different costs primarily related to transportation. Project costs will be refined as property-specific cleanup plans are developed.

4. Engineering Evaluation/Cost Analysis (EE/CA) and Public Comment

After U.S. EPA received the 2018 screening level results for the three MGI composite samples a communication strategy was developed and implemented. U.S. EPA, EGLE, and Dow communicated to all MGI property owners and other interested stakeholders. On or before May 3, 2020, U.S. EPA sent letters to MGI property owners and released a fact sheet titled “EPA’s Plans for Middleground Island in the Saginaw River.” This Fact Sheet described the initial results and U.S. EPA’s proposed next steps. U.S. EPA, with the assistance of EGLE, Dow, and State and local health departments, held availability sessions on May 15 and 21, 2020. These sessions provided information to MGI property owners and allowed owners to sign access agreements for additional soil sampling.

The 2010 SOW sets forth requirements to develop and submit response proposals. As it deems appropriate, U.S. EPA, in consultation with EGLE, may direct the use of U.S. EPA’s removal and/or remedial program authorities under CERCLA, and Dow shall submit either a Feasibility Study or an EE/CA consistent with the 2010 SOW requirements.

Based on a review of U.S. EPA’s guidance, the NCP, and conditions in MGI, U.S. EPA, in consultation with EGLE, determined that Dow should submit an EE/CA for Middleground Island. U.S. EPA documented this in an EE/CA Approval Memorandum dated August 12, 2019. Dow submitted the MGI EE/CA dated January 17, 2020. The MGI EE/CA included proposed alternatives to address contaminated soil at certain residential properties on MGI. On or before February 7, 2020, U.S. EPA released a fact sheet titled “EPA Proposes Cleanup Plan for Middleground Island.” This Fact Sheet described the MGI EE/CA and U.S. EPA’s recommended response actions and sought public comment on the Segments MGI EE/CA, pursuant to the NCP requirements.

U.S. EPA expected that the public would want more than the normal 30-day public comment period and therefore provided in advance an extension to the public comment period. The public comment period ran from February 12 through March 30, 2020. U.S. EPA held a public meeting regarding the proposed response actions on March 10, 2020, at the Boys and Girls Club on

Middleground Island, Bay City, MI. At the end of the meeting EGLE and the health departments helped answer questions. U.S. EPA also presented the proposed options to the Saginaw Tittabawassee Rivers Contamination Community Advisory Group (CAG) and a few public attendees on March 10, 2020.

U.S. EPA received written comments during the public comment period from 13 different individuals and organizations, including: the City of Bay City, Frankenlust Township, Bay County Road Commission, the CAG, and private individuals, including residents. There was also an opportunity to make verbal comments at the public meeting, and one person made verbal comments at that meeting. U.S. EPA carefully evaluated the comments and developed a Responsiveness Summary, found herein as Attachment E. Copies of all the comments received (including the transcript of the public meeting) are included in the administrative record for MGI. The public comments did not result in changes to U.S. EPA's evaluation of the options. Therefore, the selected response actions are those that were originally proposed U.S. EPA.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

In accordance with 40 C.F.R. § 300.415(j), all on-site actions required pursuant to this Action Memorandum shall, to the extent practicable, as determined by U.S. EPA, considering the exigencies of the situation, attain ARARs under federal environmental or state environmental or facility siting laws. In accordance with Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. § 300.400(e), no federal, state or local permits will be required for on-site response actions conducted as part of this removal action. U.S. EPA, in consultation with EGLE, reviewed the list of potential ARARs in the MGI EE/CA. Following is a summary of potential ARARs and to be considered guidance (TBCs) that were identified in the MGI EE/CA:

a. Federal

Potential Federal Chemical-Specific Requirements or TBCs

Clean Water Act – Federal Surface Water Quality Standards
Clean Water Act – Federal Ambient Water Quality Criteria

Potential Federal Action-Specific Requirements or TBCs

Clean Water Act – Section 402
Resource Conservation and Recovery Act – Subtitles C and D and Land Disposal Restrictions
Endangered Species Act
Bald and Golden Eagle Protection Act

Potential Federal Location-Specific Requirements or TBCs

Floodplain and Wetland Regulations and Executive Orders 11988 and 11990
Clean Water Act – Section 404
National Historic Preservation Act
Migratory Bird Treaty Act
Archeological and Historic Preservation Act

American Indian Religious Freedom Act
Archeological Resources Protection Act
Native American Graves Protection and Repatriation Act

b. State

Potential State Chemical-Specific Requirements or TBCs

Michigan Natural Resources and Environmental Protection Act (NREPA) – Part 201
Michigan Water Quality Standards

Potential State Action-Specific Requirements or TBCs

Michigan NREPA – Part 31
Michigan NREPA – Part 91
Michigan NREPA – Part 111
Michigan NREPA – Part 115
Michigan NREPA – Part 121
Michigan NREPA – Part 201 (Relocation of Contaminated Soil; 324.20120c et seq.)
Michigan NREPA – Part 365
Michigan NREPA – Part 413
Michigan Administrative Code Rule R 336.1901(a), Michigan NREPA Part 55

Potential State Location-Specific Requirements or TBCs

Michigan NREPA – Part 31
Michigan NREPA – Part 303

B. Project Schedule

Upon the effective date of the MGI AOC, Dow will start to develop a Work Plan. The Work Plan will contain a specific schedule for implementation of the Work. U.S. EPA anticipates that Work will begin in 2021. This action is anticipated to require one construction season to implement (2021).

C. Estimated Costs

The estimated cost for the required work at MGI is \$1.7 to 2.0 million. These estimated costs include labor, equipment, and materials. There is no expected long-term monitoring and maintenance, although short-term yard re-establishment maintenance costs are included. The cost estimates were developed based on a review of previous Dow project data, similar projects completed at other sites, and initial input from prospective Dow contractors. Consistent with U.S. EPA guidance, the cost estimates for each alternative are anticipated to be accurate within the range of -30 to +50 percent.

U.S. EPA guidance issued in January 2017, requested that Action Memoranda discuss potential uncertainties related to the cost estimate. The response actions selected herein will not be funded

by U.S. EPA, they will be undertaken and funded by Dow pursuant to the MGI AOC. The major uncertainty in the cost is associated with the selection of the disposal location for the excavated soil. This is reflected in the cost range, as documented in the EE/CA. Because Dow has conducted soil removal and replacement along the Tittabawassee River since 2015, there are few other cost uncertainties. There are two properties that have not yet been sampled, but if they need cleanup the scope of work is unlikely to change in a way that substantially increases costs.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Continued risk to public health or the environment will result if this response action is delayed or not taken. Delayed or no action increases the chance that people may have unacceptable exposures to contaminated soil at MGI residential properties

VII. OUTSTANDING POLICY ISSUES

According to Directive 9360.0-19, from the Office of Solid Waste and Emergency Response (OSWER), March 3, 1989, U.S. EPA Headquarters consultation must occur prior to conducting removal actions at sites that are not listed on the NPL where taking that removal action may be nationally significant or precedent-setting. That Directive at Section I.3 identifies as nationally significant or precedent-setting “[r]emoval actions at sites involving any form of dioxin when it is one of the principal contaminants of concern.” Further, the OSWER memorandum dated December 13, 1996, titled “Headquarters Consultation for Dioxin Sites,” requests that Regions consult with Headquarters where remediation goals are to be developed for dioxin in soil.

The MGI EE/CA and this NTCRA use the site-specific soil Cleanup Numbers developed by Region 5 in 2014, with Headquarters consultation. Also, this is a removal action at a non-NPL site where dioxins are the principal contaminants of concern. Therefore, Region 5 did additional consultation with Headquarters for this NTCRA at MGI. Region 5, among other activities: provided the initial screening results and advance notice of the May 2019 availability sessions; included Headquarters in the proposed plan briefing on December 19, 2019; provided to Headquarters an opportunity to review and comment on the MGI EE/CA before it was finalized, and made available to the public; and provided to Headquarters an opportunity to review and comment on the draft MGI Action Memorandum.

VIII. ENFORCEMENT

This action is being undertaken pursuant to the MGI AOC between U.S. EPA and Dow. An enforcement addendum to this Action Memorandum details the enforcement strategy at the Site.

IX. RECOMMENDATION

This decision document represents the selected NTCRA for MGI located within the Tittabawassee River, Saginaw River & Bay Site, Michigan. It was developed in accordance with

CERCLA, as amended, and is not inconsistent with the NCP. This decision is based upon the Administrative Record for MGI, an index of which is Attachment C.

Conditions at MGI meet the criteria of Section 300.415(b) of the NCP for a removal action, and we recommend your approval of the proposed removal action. Region 5 expects that Dow, the potentially responsible party, will perform the removal action under the oversight of the RPM/OSC. You may indicate your decision by signing below.

9/3/2020

APPROVE: 

Douglas Ballotti, Director
Superfund & Emergency Management Division
Signed by: DOUGLAS BALLOTTI

DISAPPROVE:

Douglas Ballotti, Director
Superfund & Emergency Management Division

Enforcement Addendum

Attachments:

- A. General MGI Location Map
- B. MGI Current Land Use
- C. Administrative Record Index
- D. EJ Screening
- E. Responsiveness Summary

cc: J. Tanaka, J. El-Zein, N. DiCosmo, M. Logan, D. Russell, J. Cahn, C. Garypie – U.S. EPA Region 5
S. Yi, U.S. EPA Headquarters, w/o Enf. Addendum
J. Victory, EGLE, w/o Enf. Addendum
P. Synk, Michigan Department of Attorney General, w/o Enf. Addendum
L. Williams, FWS, w/o Enf. Addendum

**ENFORCEMENT ADDENDUM
HAS BEEN REDACTED – FIVE PAGES**

**ENFORCEMENT CONFIDENTIAL
NOT SUBJECT TO DISCOVERY
FOIA EXEMPT**

**NOT RELEVANT TO SELECTION
OF REMOVAL ACTION**

ATTACHMENT A

General Middleground Island Location Map

**Tittabawassee River, Saginaw River & Bay Site
Midland, Saginaw, and Bay Counties in Michigan**

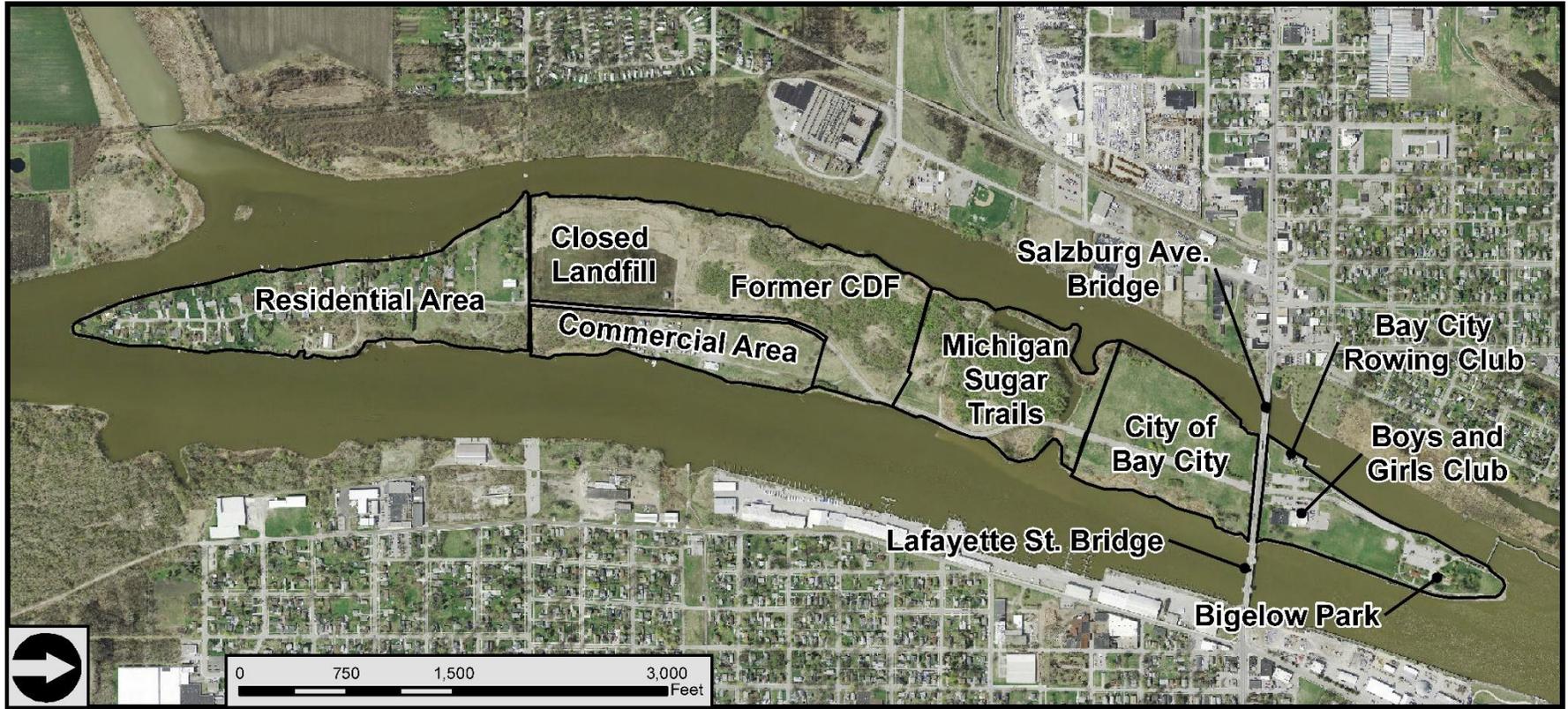


Attachment A: Middleground Island General Location

ATTACHMENT B

Middleground Island Current Land Use

**Tittabawassee River, Saginaw River & Bay Site
Midland, Saginaw, and Bay Counties in Michigan**



Attachment B: Middleground Island Current Land Use

ATTACHMENT C

Administrative Record Index

**Middleground Island of the
Tittabawassee River, Saginaw River & Bay Site
Midland, Saginaw, and Bay Counties in Michigan**

**ATTACHMENT C
U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION**

**ADMINISTRATIVE RECORD
FOR THE
TITTABAWASSEE RIVER, SAGINAW RIVER AND BAY SITE
OPERABLE UNIT 15: MIDDLEGROUND ISLAND
MIDLAND, SAGINAW AND BAY COUNTIES, MICHIGAN**

**ORIGINAL
APRIL, 2020
SEMS ID:**

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
1	954750	Undated	-----	-----	Recreation Sampling Grids	13
2	954751	Undated	-----	-----	Recreation Incremental Sampling Coordinate Tables	22
3	954756	Undated	Tittabawassee River & Saginaw River Team	Dow Chemical Co.	Addendum to Middleground Island Core Sampling Plan	8
4	914887	8/6/14	U.S EPA	General Public	Administrative Record Site Index - Tittabawassee River, Saginaw River & Bay - Removal Action - OU11: Tittabawassee River Floodplain - Original (<i>Documents on this Index are included by reference in this Administrative Record.</i>)	6
5	953248	5/1/19	U.S EPA	General Public	Fact Sheet - EPA's Plans for Middleground Island in the Saginaw River	2
6	954752	5/1/19	Tittabawassee River & Saginaw River Team	Dow Chemical Co.	Middleground Island Incremental Composite Sampling Plan	156
7	953247	5/3/19	Logan, M., U.S. EPA	Property Owners	U.S. EPA Cleanup Letter	1

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
8	954754	5/29/19	Konechne, T., Dow Chemical Co.	Logan, M., U.S. EPA	Dow Chemical Co. Cover Letter - Addendum to Middleground Island Incremental Composite Sampling Plan	1
9	953244	8/12/19	Logan, M., U.S. EPA	Ballotti, D. and Frey, R., U.S. EPA	U.S. EPA Memorandum re: Request for Approval of Engineering Evaluation /Cost Analysis for a Proposed Non-Time-Critical Removal Action	9
10	953246	8/19/19	Logan, M., U.S. EPA	Konechne, T., Dow Chemical Co.	U.S. EPA Letter - Engineering Evaluation/Cost Analysis	1
11	954755	9/10/19	Tittabawassee River & Saginaw River Team	Dow Chemical Co.	Middleground Island Core Sampling Plan	58
12	954753	11/18/19	Konechne, T., Dow Chemical Co.	Logan, M., U.S. EPA	Dow Chemical Co. Cover Letter - Draft Engineering Evaluation/Cost Analysis	1
13	953245	12/17/19	Logan, M., U.S. EPA	Konechne, T., Dow Chemical Co.	U.S. EPA Letter - Engineering Evaluation/Cost Analysis Comments	4
14	953243	1/17/20	Tittabawassee River & Saginaw River Team	Dow Chemical Co.	Middleground Island Engineering Evaluation/Cost Analysis (EECA)	52
15	953249	2/1/20	U.S EPA	General Public	Fact Sheet - EPA Proposes Cleanup Plan for Middleground Island	8
16	953141	2/5/20	McCreery, C.	-----	Private Citizen Comment - PowerPoint Presentation - Ocean Dumping of Chlorinated Hydrocarbons	42
17	953148	3/10/20	-----	-----	Proposed Cleanup Plan Public Meeting Transcript	50
18	953140	3/28/20	Private Citizens	U.S. EPA	Public Commentary (Redacted)	28
19	-----	-----	U.S. EPA	-----	Action Memorandum (Pending)	-----

ATTACHMENT D

EJ Screening

**Middleground Island of the
Tittabawassee River, Saginaw River & Bay Site
Midland, Saginaw, and Bay Counties in Michigan**

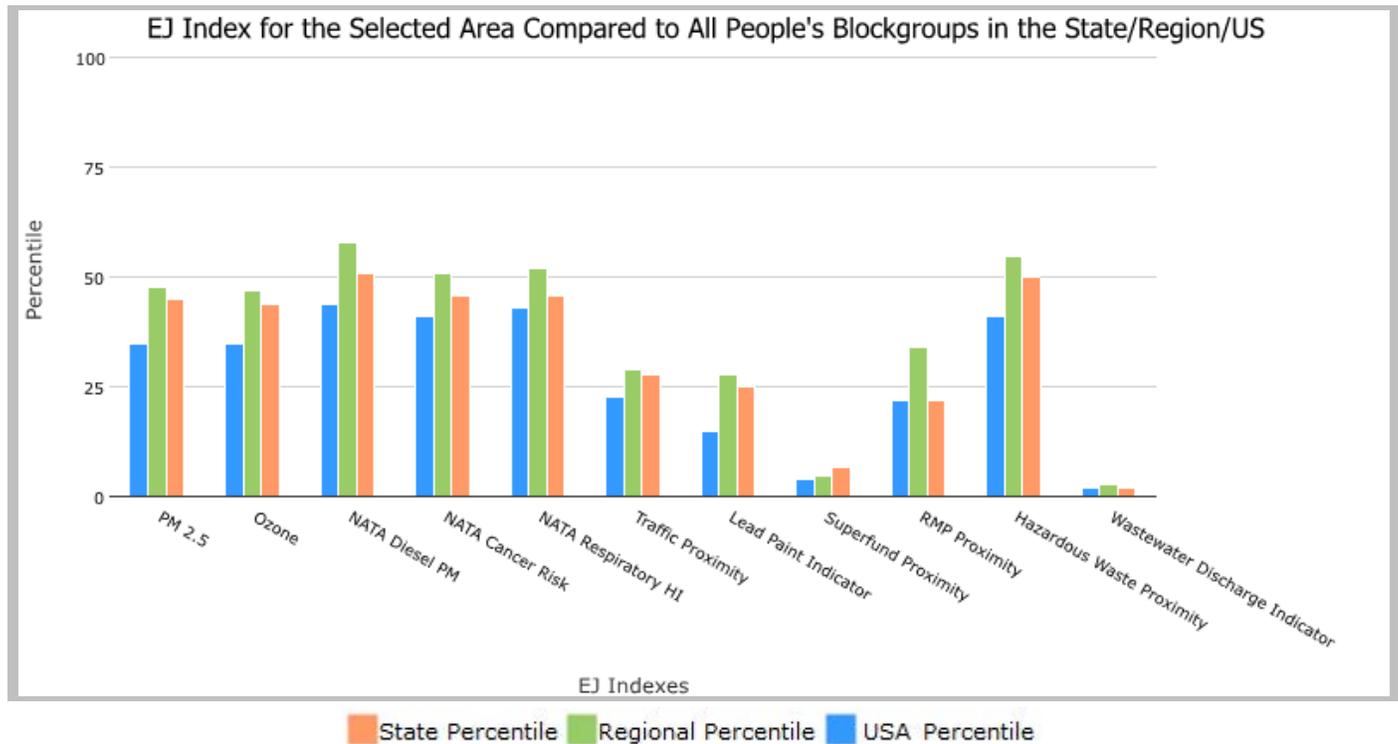
the User Specified Area, MICHIGAN, EPA Region 5

Approximate Population: 74

Input Area (sq. miles): 0.07

MGI

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	45	48	35
EJ Index for Ozone	44	47	35
EJ Index for NATA* Diesel PM	51	58	44
EJ Index for NATA* Air Toxics Cancer Risk	46	51	41
EJ Index for NATA* Respiratory Hazard Index	46	52	43
EJ Index for Traffic Proximity and Volume	28	29	23
EJ Index for Lead Paint Indicator	25	28	15
EJ Index for Superfund Proximity	7	5	4
EJ Index for RMP Proximity	22	34	22
EJ Index for Hazardous Waste Proximity	50	55	41
EJ Index for Wastewater Discharge Indicator	2	3	2



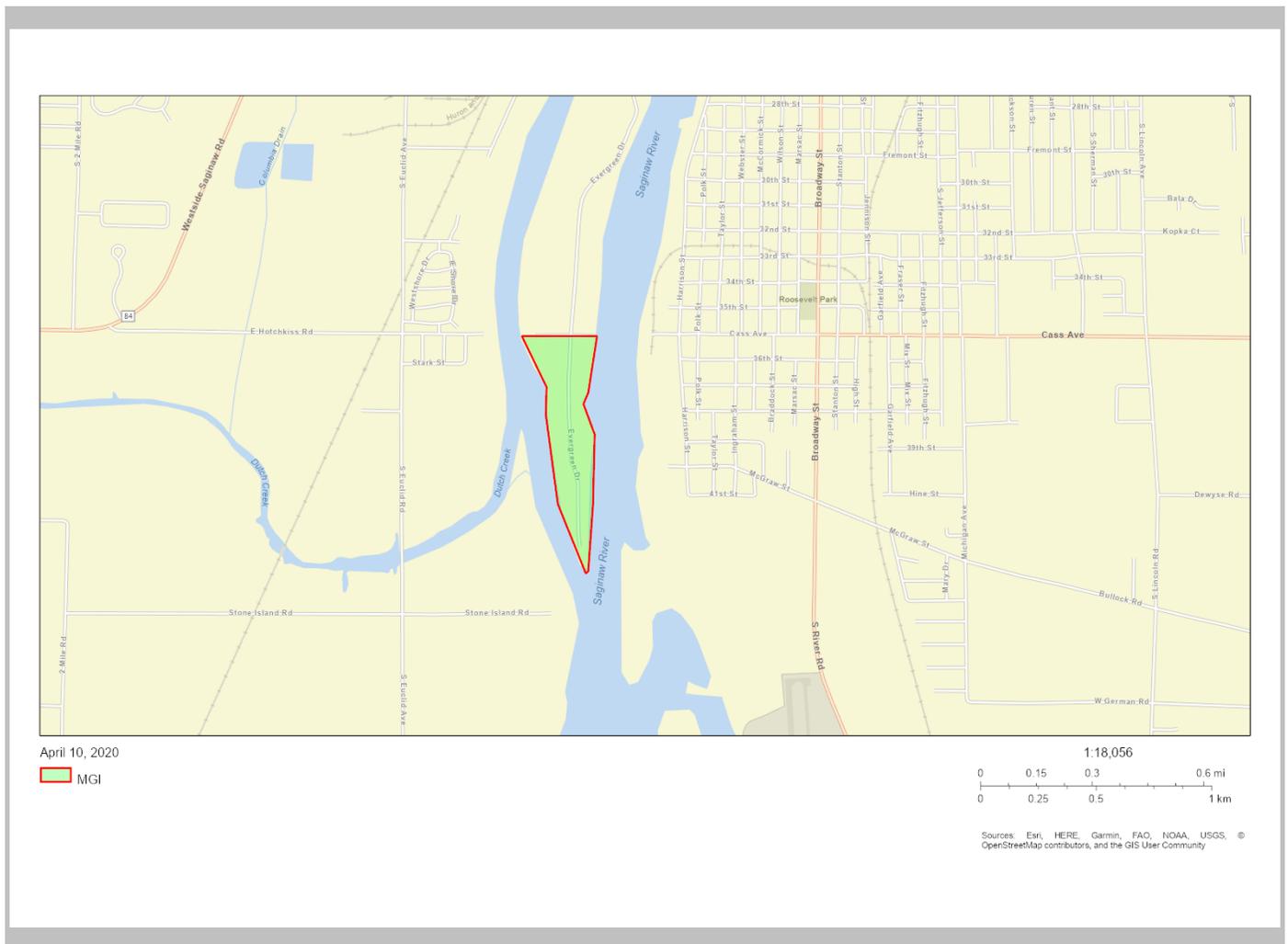
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

the User Specified Area, MICHIGAN, EPA Region 5

Approximate Population: 74

Input Area (sq. miles): 0.07

MGI



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

EJSCREEN Report (Version 2019)

the User Specified Area, MICHIGAN, EPA Region 5

Approximate Population: 74
Input Area (sq. miles): 0.07

MGI

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)	7.94	8.56	17	8.63	18	8.3	37
Ozone (ppb)	43.1	44	15	43.4	28	43	45
NATA* Diesel PM ($\mu\text{g}/\text{m}^3$)	0.167	0.338	19	0.446	<50th	0.479	<50th
NATA* Cancer Risk (lifetime risk per million)	21	24	24	26	<50th	32	<50th
NATA* Respiratory Hazard Index	0.24	0.29	26	0.34	<50th	0.44	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	290	660	54	530	61	750	56
Lead Paint Indicator (% Pre-1960 Housing)	0.41	0.38	62	0.38	60	0.28	71
Superfund Proximity (site count/km distance)	0.51	0.15	93	0.13	95	0.13	95
RMP Proximity (facility count/km distance)	0.48	0.53	69	0.82	55	0.74	59
Hazardous Waste Proximity (facility count/km distance)	0.15	1	28	1.5	23	4	26
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	1	0.23	96	0.82	94	14	95
Demographic Indicators							
Demographic Index	8%	29%	7	28%	9	36%	5
Minority Population	1%	25%	3	25%	5	39%	2
Low Income Population	16%	33%	23	31%	26	33%	24
Linguistically Isolated Population	0%	2%	63	2%	58	4%	45
Population With Less Than High School Education	3%	10%	17	10%	19	13%	16
Population Under 5 years of age	10%	6%	88	6%	86	6%	84
Population over 64 years of age	22%	16%	80	15%	82	15%	83

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <https://www.epa.gov/national-air-toxics-assessment>.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

ATTACHMENT E

Responsiveness Summary

**Middleground Island of the Tittabawassee River, Saginaw River & Bay Site
Midland, Saginaw, and Bay Counties in Michigan**

RESPONSIVENESS SUMMARY

Non-Time Critical Removal Action for Middleground Island of the Tittabawassee River/Saginaw River & Bay Site

This Responsiveness Summary provides a summary of the public comments that the United States Environmental Protection Agency (EPA) received regarding a proposed non-time critical removal action (NTCRA) at Middleground Island (MGI) and comments on the *Middleground Island Engineering Evaluation/Cost Analysis*, dated January 17, 2020 (MGI EE/CA) at the Tittabawassee River/Saginaw River & Bay Site (Site). This Responsiveness Summary also provides EPA's responses to those comments, developed in consultation with the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

I. Outcome of Review of Public Comments and State Consultation

After carefully reviewing and considering all public comments submitted during the public comment period, EPA, in consultation with EGLE, is issuing an Action Memorandum selecting response actions for MGI. This Responsiveness Summary is an attachment to the Action Memorandum. The public comments did not result in changes to EPA's comparative evaluation of the options. Therefore, the selected response actions are those that were identified by EPA as the recommended alternatives.

EPA, after consultation with EGLE, negotiated an Administrative Settlement Agreement and Order on Consent (MGI AOC) with The Dow Chemical Company (Dow), requiring Dow to implement the selected work. A copy of the MGI AOC, Action Memorandum, and this Responsiveness Summary (which is Attachment E to the Action Memorandum) will be available through <http://www.epa.gov/superfund/tittabawassee-river>.

II. Background and Community Involvement

Dioxins (primarily furans) are found in the Tittabawassee and Saginaw Rivers and their floodplains, and in Saginaw Bay. The dioxins came from past waste disposal practices at Dow's plant in Midland, Michigan. EPA began negotiations with Dow in December 2008 for a comprehensive approach to address contamination related to Dow in the rivers and Bay. Effective January 21, 2010, EPA signed an Administrative Settlement Agreement and Order on Consent No. V-W-10-C-942 (2010 AOC) with EGLE and Dow, requiring Dow to perform Site investigations, and develop and design cleanup options selected by EPA, in consultation with EGLE, using Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) authority. Work under the 2010 AOC is ongoing.

The 2010 AOC requires Dow, with EPA and EGLE oversight, to conduct evaluations of current conditions and assessments of response options to protect human health and the environment at the Site. EPA, in consultation with EGLE, determined that Dow should submit an Engineering Evaluation/Cost Analysis (EE/CA) for MGI based on a review of EPA's guidance, the National Contingency Plan (NCP), and conditions on MGI, and documented this in an EE/CA Approval

Memorandum dated August 12, 2019. Dow submitted the final MGI EE/CA dated January 17, 2020, that includes proposed response alternatives to address soil contamination at residential properties on MGI.

On or before February 7, 2020, EPA established the administrative record for MGI. EPA published the administrative record on the Site website at www.epa.gov/superfund/tittabawassee-river and sent copies to three local repositories (public libraries in Midland, Saginaw and Bay City). On or before February 7, 2020, EPA posted and mailed a fact sheet titled “EPA Proposes Cleanup Plan for Middleground Island.” This Fact Sheet described the MGI EE/CA and U.S. EPA’s recommended response actions and sought public comment on the Segments MGI EE/CA and the administrative record, pursuant to the requirements of NCP § 300.415(n). The fact sheet was mailed to a list of about 950 recipients. EPA took ads in two local papers to announce the proposed cleanup plan and the opportunities for public comment.

EPA expected that the public would want more than the normal 30-day public comment period and therefore provided in advance a 15-day extension to the public comment period. The public comment period ran from February 12 through March 30, 2020. EPA held a public meeting regarding the proposed response actions on March 10, 2020, at the Boys and Girls Club on Middleground Island, Bay City, MI. At the end of the meeting EGLE and the health departments helped answer questions. EPA also presented the proposed options to the Saginaw Tittabawassee Rivers Contamination Community Advisory Group (CAG) and a few public attendees on March 10, 2020.

III. Comments and Responses

EPA received written comments during the public comment period from 13 different individuals and organizations, including: City of Bay City, Frankenlust Township, Bay County Road Commission (BCRC), the CAG, and private individuals, including residents. There was also an opportunity to make verbal comments at the public meeting, and one person made verbal comments at that meeting. Copies of all the comments received (including the verbal comments reflected in the transcript of the public meeting) are included in the administrative record for MGI. EPA carefully considered each comment while developing this Responsiveness Summary.

This Responsiveness Summary does not repeat verbatim each individual comment. Rather, the relevant comments are summarized and grouped by category with respect to the type of issue raised. The comments fell within a few different categories: remedy options; remedy implementation; and information requests, questions, and recommendations. The remainder of this Responsiveness Summary contains a summary of the comments received (grouped by category) and EPA’s responses to those comments, in consultation with EGLE.

A. REMEDY OPTIONS

1. The CAG and two other commenters supported EPA’s proposed cleanup plan.

EPA and EGLE acknowledge these comments.

- 2. One commenter proposed jacking up houses by two feet and bringing in clean dirt to fill yards.*

A cleanup option considered by EPA, but not selected, was placement of a clean cover. This would not involve jacking up houses but would have put a layer of clean soil over the existing contaminated soil. EPA did not select the clean cover option because of concerns with long-term effectiveness and implementability. Clean covers may be less reliable in the long-term because integrity of the cover relies on compliance of individual property owners with long-term land use restrictions. Covers must be monitored and may need maintenance to make sure they continue to be reliable. EPA's selected response action, removal, would be more effective in the long term because it permanently removes contaminated soil from yards. Long-term agreements and institutional controls would be requested of property owners if a clean cover is placed and some owners may be reluctant to allow ongoing access or to place institutional controls. Additionally, jacking up houses would pose technical implementation challenges and would not be needed as part of the cleanup plan.

- 3. The CAG asked whether using the composite sampling method could result in "hot spots" that exceed the cleanup level on some properties while the overall composite does not. The CAG "would like to see borderline contamination properties be cleaned up if the evidence suggests higher levels could exist."*

In 2015, EPA and EGLE established a site-specific dioxin/furan cleanup number of 250 parts per trillion (ppt) for residential properties. Exceedance of EPA's cleanup number based on composite sampling identifies properties eligible for cleanup. The sampling approach involved collection of 60 sub-samples that were composited. Therefore, mathematically there could be some sub-samples that, if sampled alone, could exceed 250 ppt while the overall composite result is below the cleanup number. However, EPA does not believe this is a concern. First and foremost, the site-specific cleanup number was based on conservative exposure assumptions and is protective for all ages and users. Second, the composite sampling units on each property were established to reflect likely use and exposure; where appropriate properties were sub-divided for sampling. EPA expects that exposure can take place in many areas of a yard and the sampling units reflect this.

- 4. The CAG requested that EPA and Dow to explore opportunities for non-eligible properties to have access to yard cleanup at a reasonable cost while the project is under mobilization, especially those whose contamination levels approaching 250 ppt.*

EPA has communicated to all the residential property owners informing them of their analytical results and whether their property is eligible for cleanup. Neither EPA nor Dow have been approached to request cleanup by an owner of property below EPA's cleanup number. EPA intends to work closely with the community as we plan the cleanup. If a non-eligible owner is interested in work, EPA cannot mandate that a cleanup is needed but we will try to work with them on a case by case basis to see what options may be available.

B. REMEDY IMPLEMENTATION

- 5. The vast majority of comments received expressed concerns with the potential effects that construction traffic could have on Evergreen Drive, the only road running the length of*

Middleground Island. Comments on this topic were received from the City of Bay City, the BCRC, Frankenlust Township, the CAG, and an individual commenter.

a. The City of Bay City, the BCRC, and Frankenlust Township each explained its jurisdiction and role regarding Evergreen Drive

EPA appreciates the clarification on roles and responsibilities. EPA and Dow will work with these entities as work progresses.

*b. **Safety Concerns:** Commenters pointed out that there are traffic safety concerns with Evergreen Drive's intersection with M-13/M-84 between the bridges. There are many times during the day when it is difficult to make a turn, right or left, from Evergreen Drive. A temporary signal has been utilized in the past and may be warranted again. Evergreen Drive is very narrow with limited room for larger vehicles increasing congestion and the potential for adverse impacts. On Evergreen Drive, slow speed limits, clear lane management, and/or flagging may be warranted to protect people and to limit the potential for deer strikes.*

EPA, EGLE, and Dow all acknowledge that project safety is of paramount importance and realize that traffic safety is a major concern. Dow will develop and implement a traffic management plan and a health and safety plan with EPA and EGLE oversight. Among other elements, rigorous safety measures will be developed and implemented throughout the project. The traffic safety measure will be reviewed with interested entities ahead of time.

c. The commenters recognized that either cleanup alternative could result in a significant amount of truck traffic. They expressed concern with potential damage to Evergreen Drive, shoulders, driveways, lawn areas, road right-of-way, drainage facilities, or any other items in the road right-of-way. If damaged these will need to be restored. One commenter asked who would fix the road if damaged?

Dow will be conducting the cleanup with EPA and EGLE oversight. The traffic management plan will require Dow to restore any damage to conditions as good as those before work begins.

d. Both the City of Bay City and the BCRC offered to complete a pre-construction video of the roadway and adjacent right-of-way, to document the conditions before the project begins. This video is anticipated to be used/reviewed to resolve issues or questions regarding what was in place prior to construction.

EPA agrees that a pre-construction video is essential. Dow would need to complete a video as part of the traffic management plan. Therefore, EPA will coordinate with Dow, the City and BCRC to see if all parties can develop a consensus-based video.

e. The commenters stated that depending on the time of year, dust or mud on the road could become an issue that should be addressed, as the need arises.

EPA agrees. The traffic management plan will ensure that dust and/or mud on the roadway will be managed.

- f. *Commenters stated that access to residents and businesses on Evergreen Drive must always be maintained during construction, especially for emergency responders. This includes proper construction signage prior to and within, the construction zone.*

EPA agrees. The traffic management plan will ensure access and signage.

- g. *Commenters asked that communication occur to alert 911, schools (project date dependent), the BCRC, Frankenlust Township, the City of Bay City and any others prior to starting any construction. Good communication between all parties involved is key, especially due to the project's close working quarters.*

EPA agrees. EPA and Dow will communicate with interested entities prior to and during construction.

6. *The CAG commented about individual property landscaping: "The CAG feels strongly that every effort should be made to preserve mature and healthy trees, and that landscaped areas be restored in keeping with the care and effort that property owners put into them." "We recognize that this cleanup requires a lot of property-specific planning and strongly encourage that Dow work closely with property owners and that their concerns about their property be used to guide cleanup to the extent reasonable."*

Each eligible property will have a property-specific design plan that reflects input from the owner. Like the ongoing Tittabawassee River floodplain cleanup, mature healthy trees will be preserved to the extent possible, if that is the homeowner's wish. Dow will work closely with each owner to develop an acceptable plan.

7. *The CAG commented that contingency plans might be necessary if lake levels remain high. "The CAG understands that river levels have historically fluctuated over time and could be assumed to drop significantly in the near future in keeping with the historical record. However, we also recognize that the Corps of Engineers does not think this will happen again, and that continuing water level rise in the Great Lakes is a considerable risk moving forward. As such, the CAG believes that it is important for EPA and EGLE to not simply assume that the lake level will drop, but to recognize that we might be in a new normal, and plan accordingly by making appropriate contingency plans for river levels to stay at the current heights and even higher."*

EPA, EGLE, and Dow are tracking lake levels and will continue to do that. If it appears that lake levels may continue to be high, we will consider contingency plans, as needed.

8. *The CAG commented on potential erosion and would like Dow to undertake regular monitoring of shoreline areas and take immediate interim control measures at signs of erosion*

Erosion control is part of each construction project along the rivers and will be conducted throughout the MGI cleanup. The project will need to meet the requirements of Part 91 of Michigan's Natural Resources and Environmental Protection Act (NREPA) that addresses Soil Erosion and Sedimentation Control (MCL 324.9101 et seq.).

9. *One commenter asked whether property adjacent to those cleaned up be repaired if needed?*

If a property adjacent to one cleaned up is damaged it will be restored by Dow's contractors.

10. *One commenter asked why not bring in material and equipment by barge?*

The final design plan will identify how materials are to be transported to and from MGI. Barging is not out of the question, but unlikely. Many of the materials and much of the equipment are expected to originate near Midland or Freeland. Trucking to a location to load a barge would be just as long or longer than trucking directly to MGI. Barging would require docking and handling infrastructure on the island that does not currently exist. Barging would also result in double handling of the materials and equipment.

11. *One commenter expressed concerns with the disposal location of the excavated contaminated soil. He strongly opposed ocean dumping. He requested documentation of the disposal location in the final project documents.*

Ocean disposal has never been considered or used for any materials generated from CERCLA cleanups at the Site. Ocean disposal will not be considered or used for materials from the MGI cleanup. The location of soils and other materials from the MGI cleanup will be documented in the final report.

C. INFORMATION REQUESTS, QUESTIONS, AND RECOMMENDATIONS

12. *One owner's property had not yet been tested and he requested sampling.*

The sampling has been arranged and results will be conveyed to the owner, when available.

13. *The CAG stated, "The CAG feels strongly that all results be shared with and explained to all property owners, not just those whose properties exceed the limits."*

EPA and/or Dow have provided their sampling results and additional information to all MGI property owners where samples have been taken.

14. *The CAG requested information about the results for residential properties that did not exceed the cleanup level of 250 ppt; how many properties had results between 200 and 250 ppt?*

Table 4-1 of the MGI EE/CA reports analytical results for residential properties. There were six residential sampling units out of 45 that had results between 200 and 250 ppt TEQ.

15. *The CAG recommended that additional testing be considered for properties that "have significant contamination but do not exceed 250," for sub-areas close to the homes, children's play areas, etc.*

No details or sampling plans have been developed, but EPA expects that additional sampling may occur on MGI properties before the cleanup is complete.

16. *The CAG would like to understand the risks of erosion prior to and during the cleanup efforts and the mitigation efforts that will be used to ensure erosion is kept to a minimum.*

EPA will make a presentation at one of the CAG meetings to address these questions.

17. *One commenter asked if the current high water levels in the Saginaw River and Bay have any effect on the samples results.*

No, the current high water levels in the Saginaw River and Bay would not be expected to influence soil sample results. Dioxins are hydrophobic and will not readily desorb from soil into water. Additionally, most of the soil sub-samples were not saturated.

18. *One commenter asked whether crawl spaces were part of the testing. The commenter expressed concerns with exposure in the crawl space because the floor is dirt.*

Crawl spaces were not included in the composite samples. EPA's cleanup number is based on potential exposure of a small child to yard soil every day except when the soil is frozen, or snow covered. The expected exposure to soil in a crawl space would be much less frequent and typically not small children. Information about limiting exposure has been provided to every residential property owner on MGI, including this owner. Additionally, this owner has been provided contacts at the State and County health departments.

19. *The same commenter expressed concern with potential exposure while working in her yard.*

In 2019 this property was assessed, and interim exposure controls were placed including mulching in garden beds and covering bare soil. The property will be reevaluated later this year to see if additional short-term measures should be considered. Information about limiting exposure and contacts at the health departments have been provided to this resident.