Formerly Used Defense Sites Program
U.S. Army Corps of Engineers (USACE)

PROPOSED PLAN
Area of Concern 16 - Former Sewage Treatment Plant
Former Grosse Ile Naval Air Station
Grosse Ile, Michigan
December 2021

DATES TO REMEMBER

Public Comment Period:	22 August 2022 - 30 September 2022
Public Meeting:	14 September 2022; 7:00 to 8:00 EDT

USACE will accept written comments on this Proposed Plan via U.S. mail, fax, or electronic mail during the public comment period. Written comments must be postmarked or posted no later than the last day of the public comment period.

PUBLIC MEETING: 14 September 2022; 7:00 to 8:00 EDT

USACE will hold a public meeting to present this Proposed Plan and encourage public participation. Oral and written comments will also be accepted during the meeting. The meeting will be an online virtual meeting.

Persons wishing to attend this online public meeting should register in advance no later than September 13, 2022, by 4:00 p.m. EDT. To register, call or email the USACE Louisville District Public Affairs Office at (502) 315-6769 or charles.w.delano@usace.army.mil.

Join meeting by internet at https://usace1.webex.com/
Meeting number: 2762 693 7283, Access Code: XB6pP93$
By phone: Toll-free (844) 800-2712 or (669) 234-1177, Access Code: 2762 693 7283

For more information, see the Administrative Record File at:

Trenton Veterans Memorial Library
2790 Westfield Road
Trenton, Michigan 48183
(734) 676-9777

or

U.S. Army Corps of Engineers
Public Affairs Office
600 Dr. Martin Luther King Jr. Place
Louisville, Kentucky 40202
(502) 315-6769

Website: http://www.lrl.usace.army.mil/GrosseIleNavalAirStation/

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1.0 INTRODUCTION

This Proposed Plan[1] identifies No Action as the Decision for Area of Concern (AOC)[2] 16, Former Sewage Treatment Plant, of the former Naval Air Station Grosse Ile (NASGI). NASGI is Formerly Used Defense Sites (FUDS) site E05MI0123 and Michigan Department of Environment, Great Lakes, and Energy (EGLE) Facility 0003388. This Proposed Plan provides background information for AOC 16 and describes the rationale for the No Action determination. This Proposed Plan is issued by the U.S. Army Corps of Engineers (USACE), the lead agency, in coordination with EGLE, which is providing regulatory support. The USACE is providing the public an opportunity to comment and participate in the decision process. The USACE, in coordination with EGLE, will review and consider all information submitted during the public comment period before finalizing the Recommendation for AOC 16. The USACE may modify the recommendation based on new information or public comments. The public is encouraged to review and comment on this Proposed Plan. Information about the public comment period and public meeting is provided below.

The USACE has prepared this Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This Proposed Plan summarizes information that can be found in greater detail in the historical documents contained in the Administrative Record for this site. Historical documents are available for review at the Information Repository identified below. The primary USACE, contractor-prepared reports that serve as the basis for the information presented in this Proposed Plan include the Final Remedial Investigation (RI) Report Phases I and II (Ellis Environmental Group, LC [EEG], May 2007) and the Expanded Field Investigation Report (Parsons Engineering Science, Inc. [Parsons], September 1998)[3].

Public Comment Period/ Information Repository Location	**Administrative Record/ MailingAddress for Written Comments**
22 August 2022- 30 September 2022 Trenton Veterans Memorial Library 2790 Westfield Road Trenton, MI 48183 Phone: (734) 676-9777	USACE Public Affairs Specialist: Charles Delano USACE Louisville District Public Affairs Office PO Box 59 Louisville, KY 40201-0059 Phone: (502) 315-6769 fudslrlpubliccomments@usace.army.mil

[1] A Glossary can be found in **Appendix A**.
[2] A list of Acronyms and Abbreviations can be found in **Appendix B**.
[3] A list of References can be found in **Appendix C.**

2.0 SITE LOCATION AND HISTORY

The former NASGI comprises 607 acres of the southernmost portion of the Detroit River island of Grosse Ile, located in Wayne County, Michigan (**Figure 1**). The NASGI is a site in the FUDS program. FUDS are properties that the Department of Defense (DoD) once owned or used, but no longer control. The cleanup of a FUDS is part of the Defense Environmental Restoration Program. The former NASGI was purchased by the State of Michigan, leased to the Naval Reserve Aviation Base, and operated as a Naval Air Station and Army Nike Ajax missile site and was closed in 1969.

Although the former NASGI contains a number of AOCs, this Proposed Plan is specific to AOC 16. AOC 16 is the site of a former sewage treatment plant, which was constructed circa 1942 and is presumed to have been used by the DoD until the NASGI was declared excess in 1969. The sewage treatment plant was demolished in 1980. AOC 16 is located south of Groh Road and west of the airport runways (**Figure 2**).

The sewage treatment plant features included a main building, an emergency electric generator, an oil water separator (abandoned in place), underground piping (abandoned in place), settling tanks, and concrete-lined drying beds. Navy personnel reported several releases into Frenchman's Creek had occurred at the emergency outfall due to operations at the sewage treatment plant, including dumping of raw sewage into Frenchman's Creek when the sewage treatment plant system was non-operational. The sewage may have contained contaminants discharged by various historical operations at the former NASGI. Groundwater is an incomplete exposure pathway because it is unusable due to saline content.

The details of the investigation conducted at AOC 16 are presented in the following USACE, contractor-prepared reports: Expanded Field Investigation Report (Parsons, 1998), and the Final RI Report Phases I and II (EEG, 2007). Investigative activities included collection of soil samples from the sludge drying beds and former emergency generator area, and collection of a sediment sample from Frenchman's Creek at the sewage treatment plant emergency outfall. EGLE Part 201 criteria were used for the data evaluation.

3.0 SITE CHARACTERISTICS

AOC 16 is primarily located within the airport property owned by Grosse Ile Township. AOC 16 is approximately 4 acres in size (**Figure 2**). The former NASGI is 607 acres. There are no buildings on the portion of AOC 16 formerly occupied by the sewage treatment plant, but residential structures are located along the northern boundary of the AOC. Most of the ground surface is grass-covered.

Soil at AOC 16 consists of fill material underlain by clayey glacial lake deposits. Soil borings were completed to a maximum depth of 12 feet (ft) below ground surface (bgs). Groundwater was not encountered in the borings.

Bedrock beneath the former NASGI is dolomite of the upper unit of the Detroit River Group. The upper 5 to 10 ft of bedrock can be highly weathered and heavily

fractured. Depth to bedrock was not determined but is greater than 12 ft bgs, which is the maximum depth of the borings

4.0 SITE INVESTIGATIONS

Environmental investigations were performed to evaluate the nature and extent of potential contamination associated with the former sewage treatment plant at AOC 16. Sampling was biased to features considered to have the highest potential to impact the environment, including the sludge drying beds, emergency generator building, and emergency outfall. The details of the investigation are presented in the Expanded Field Investigation Report and the RI Report**.**

The AOC 16 data evaluated in the RI were collected 17 to 24 years ago. Since the data were originally evaluated, the EGLE Part 201 criteria as well as the U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) have been updated. A rescreening of the data was completed to ensure that no Chemicals of Concern (COCs) would be identified, and that the No Action Decision is still valid as requested by EGLE in a 22 January 2015 project scoping session with USACE. A data comparison to the 2013 EGLE Part 201 criteria is provided in **Appendix D**. The discussion herein is based upon results from the comparison of the data to 2013 EGLE Part 201 criteria unless otherwise indicated. The EGLE Part 201 criteria are similar to USEPA RSLs and are considered protective since their values are within the CERCLA risk range. No COCs were identified by the rescreening. The rescreening results and discussion presented herein validate the original conclusions of the RI indicating the No Action determination is still correct. All data were considered usable.

According to the Expanded Field Investigation Final Report (Parsons, 1998), one near surface soil sample was collected from each of the four sludge drying beds in 1996. These soil samples were field screened using a field gas chromatograph for benzene, toluene, ethylbenzene, and xylenes (BTEX). BTEX was not detected by the field screening.

According to the RI Report (EEG, 2007), additional soil samples were collected in 2003 at the sludge drying beds and in the area of the emergency generator pad as part of the RI Investigation. The soil samples were collected from depths ranging from 0 to 12 ft bgs and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Methylene chloride was detected in one soil sample at a concentration exceeding EGLE's 2013 Residential Vapor Intrusion Soil Screening Level (SVI-res). No other chemicals were detected in the soil samples at concentrations exceeding the EGLE Part 201 Generic Residential Cleanup Criteria (GRCC) or SVI-res. The soil sampling locations are shown on **Figure 2**.

The RI Report (EEG, 2007) indicated that a sediment sample was collected in 2005 from Frenchman's Creek at the emergency outfall of the sewage treatment plant. The sediment sample was analyzed for VOCs, SVOCs, and metals. There was insufficient evidence to conclude arsenic and barium concentrations were significantly greater than background concentrations. Several chemicals were identified in the sediment at concentrations exceeding the USEPA ecological

sediment screening levels, including methylene chloride and numerous polynuclear aromatic hydrocarbons (PAHs). The sediment sampling location is shown on **Figure 2**.

The RI Report recommended that a No Action Decision was appropriate for AOC 16. As summarized in Section 6.0, the Human Health Risk Assessment (HHRA) identified no Chemicals of Potential Concern (COPCs) and the Ecological Risk Assessment (ERA) identified no Chemicals of Ecological Concern (COECs), indicating No Action is warranted from human health and ecological perspectives.

5.0 SCOPE AND ROLE OF THE DECISION

The USACE is responsible for the environmental investigation and cleanup program pertaining to former DoD activities at the NASGI site. This Proposed Plan exclusively addresses AOC 16. Other AOCs are in various phases of the CERCLA or underground storage tank closure processes.

The USACE has determined that No Action is required for AOC 16. No adverse effects to human health or the environment are anticipated as a result of former operations at AOC 16.

6.0 SUMMARY OF RISK ASSESSMENTS

An HHRA was completed as part of the RI Report for AOC 16. The HHRA compared site soil and sediment concentrations to applicable EGLE Part 201 Residential and Non-Residential criteria. Based on the results of the HHRA, No Action was warranted. This finding was supported by a comparison of site data to 2013 EGLE criteria. An ERA was also completed as part of the RI Report. The ERA and subsequent assessment found there is no suitable terrestrial habitat and identified no COECs in Frenchman Creek sediment. Based on the results of the ERA, No Action was warranted. The sections that follow detail the Human Health and Ecological Risk Assessments for the site.

6.1 Land Use

AOC 16 is situated west of the runways. The majority of AOC 16 is vacant space between the airport runway and Frenchman's Creek. The northern-most portion of AOC 16 is used for residential purposes.

6.2 Human Health Risk Assessment

An HHRA for AOC 16 was presented in the RI Report. Chromium and methylene chloride were identified in soil at concentrations greater than the 2002 EGLE Part 201 criteria. These chemicals were evaluated in the HHRA, which concluded that chemical concentrations detected at AOC 16 were within the NCP acceptable risk range. There was insufficient evidence to conclude arsenic concentrations were significantly greater than background concentrations.

The site characterization data have been compared to EGLE's 2013 Part 201 criteria. The determination of background levels for metals was updated subsequent to the RI Report. The background level was substituted for the GRCC where the GRCC is less than background. GRCC are more conservative than the Generic Non-Residential Cleanup Criteria, and are considered protective for residential,

commercial, and industrial users. Arsenic and chromium were not detected at concentrations exceeding the updated regional background levels or GRCC, as applicable.

Methylene chloride was detected in one soil sample at a concentration greater than the SVI-res. Based upon the isolated exceedance and that methylene chloride was not detected in the other soil samples, COPCs were not identified and no additional evaluation was warranted. No other chemicals were detected in the soil at concentrations exceeding 2013 EGLE criteria for:

- Direct contact with soil
- Leaching from soil into groundwater and venting to surface water
- Inhalation of particulates
- Vapor intrusion to indoor air.

The sediment sample results were compared to EGLE criteria as part of the Risk Assessment. Methylene chloride was identified as chemical constituents detected at concentrations exceeding the 2002 EGLE Part 201 criteria. Methylene chloride is a common laboratory contaminant. Methylene chloride was detected in both the sample and the blank, as indicated by the B-qualifier, which suggests it was an artifact of the laboratory process. Based upon this data evaluation, COPCs were not identified. The HHRA findings and subsequent assessment indicate No Action is warranted from a human health perspective.

6.3 Ecological Risk Assessment

An ERA was completed in the RI Report and found there is no suitable terrestrial habitat so no COPECs were identified.

Since the RI was completed, a potential sediment exposure pathway in Frenchman's Creek at the emergency outfall from the former sewage treatment plant was evaluated to ensure that there are no ecological risks to aquatic ecological receptors. This additional evaluation is included in **Appendix E** of this Proposed Plan.

Appendix E presents an evaluation of the sediment data using USEPA's Equilibrium Partitioning Sediment Benthic Toxicity Units (ESBTU) procedure. The evaluation concluded that the mixture of PAH concentrations is not anticipated to affect sensitive benthic organisms. No other metals were detected in the sediment at concentrations exceeding the ecological screening levels. Methylene chloride was detected at a concentration exceeding the USEPA Region 5 Ecological Screening Level but was less than the Oak Ridge National Laboratory Secondary Chronic Value, and the result was qualified due to blank contamination. Based on this data evaluation, no Contaminants of Ecological Concern (COECs) were identified in Frenchman's Creek at AOC 16. The ERA findings and subsequent sediment assessment indicate No Action is warranted from an ecological perspective.

7.0 PROPOSED ALTERNATIVE

This Proposed Plan does not include an alternatives evaluation since a Feasibility Study was not needed. This Proposed Plan is for a No Action Alternative. Based on the findings of the RI, No Action is warranted at AOC 16 for the protection of human health and the environment. The USACE, in coordination with EGLE, will finalize the Decision for AOC 16 in a Decision Document after evaluating comments received during the public comment review period.

8.0 COMMUNITY PARTICIPATION

The USACE and EGLE are soliciting input from the community on the No Action Decision and encourage the public to gain a more comprehensive understanding of AOC 16. The dates for the public comment period and the locations of the Administrative Record files are provided on page 1 of this Proposed Plan.

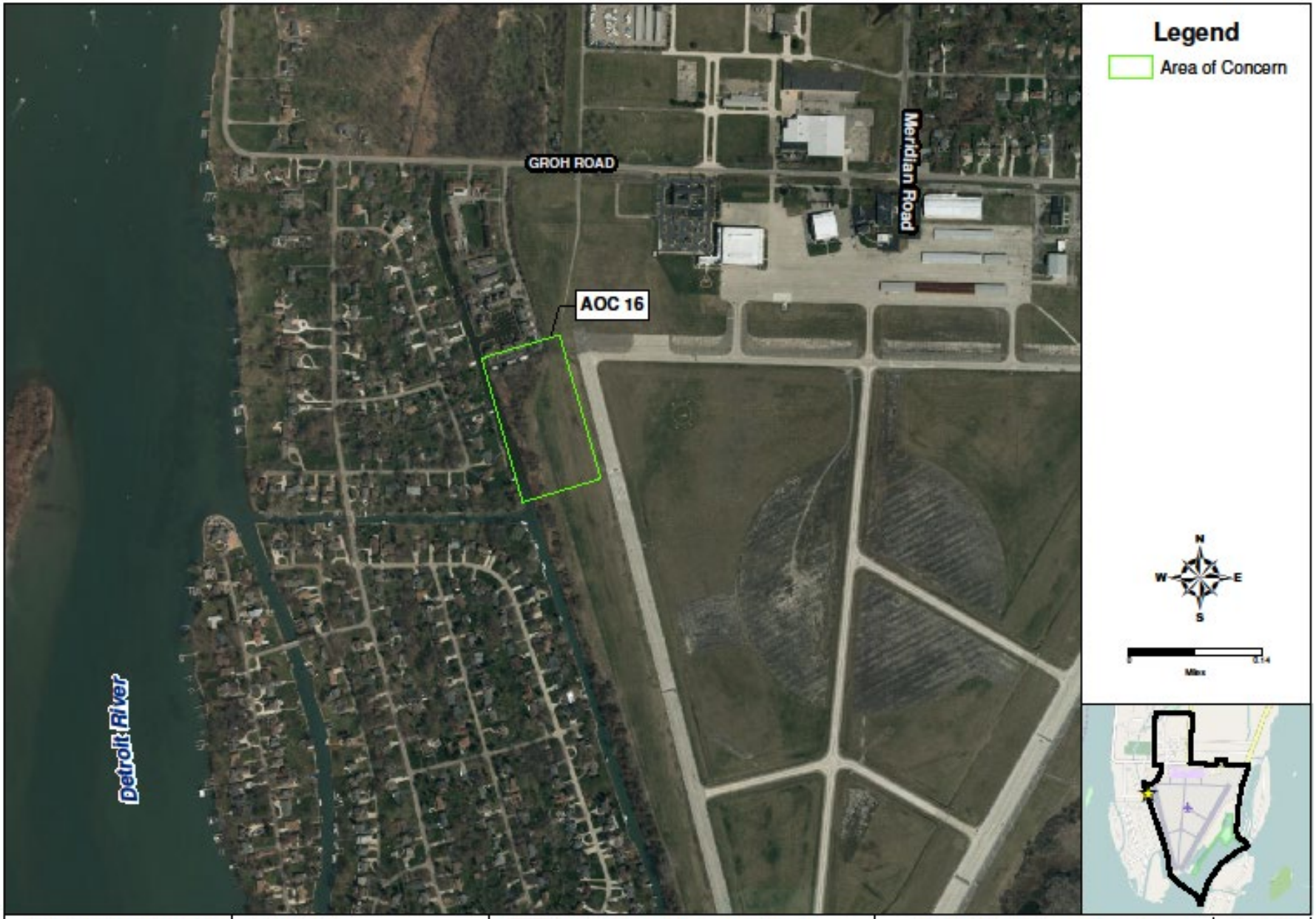
The public comment period provides time to review and comment on the information provided in this Proposed Plan. The public comment period for this Proposed Plan is presented on page 1.

Comments on this Proposed Plan or other relevant issues can be submitted in writing by email or mail (postmarked no later than 30 September 2022) to Mr. Charles Delano. Contact information for Mr. Delano is provided on page 1 of this Proposed Plan.

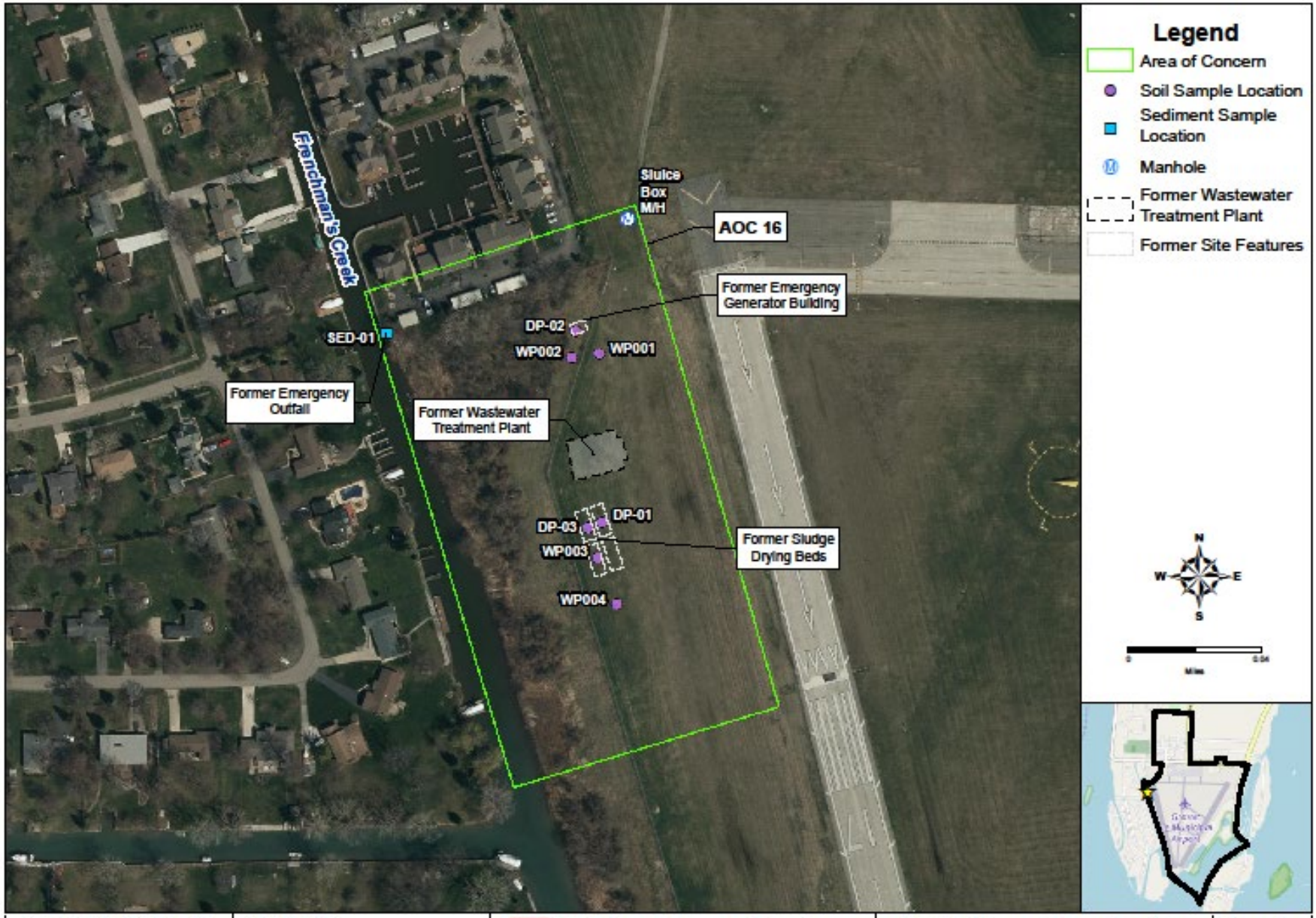
During the public comment period, the USACE will hold a public meeting to provide an additional opportunity for the public to learn about the No Action Decision and to comment on this Proposed Plan. The public meeting will be held virtually at the date and time presented on the front page of this Proposed Plan. Information for how to join the virtual public meeting is also provided on the front page.

The USACE will develop a transcript of the public meeting, and a copy of the transcript will be placed in the Administrative Record file. The USACE will review and consider the public's input as part of the process before finalizing the Decision. Comments regarding environmental activities at this AOC received on this Proposed Plan during the public meeting and comment period will be summarized, and responses will be provided in the Responsiveness Summary section of the Decision Document. The Decision Document will present the Decision and will be included in the Administrative Record file. The USACE and the EGLE encourage the public to review the Administrative Record file for AOC 16, submit comments, and attend the public meeting.

LIST OF FIGURES



PREPARED BY: AS CHECKED BY: LF DATE: May 2017 IMAGERY SOURCE: © OpenStreetMap (and) contributors, CC-BY-SA Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community File: G:\Grosse Ile\a_mxd\AOC 16\Site_Location_Map_AOC16.mxd	US Army Corps of Engineers Louisville District	AOC 16 Site Location Map Former NASGI Grosse Ile, Wayne County, Michigan	Figure No. 1



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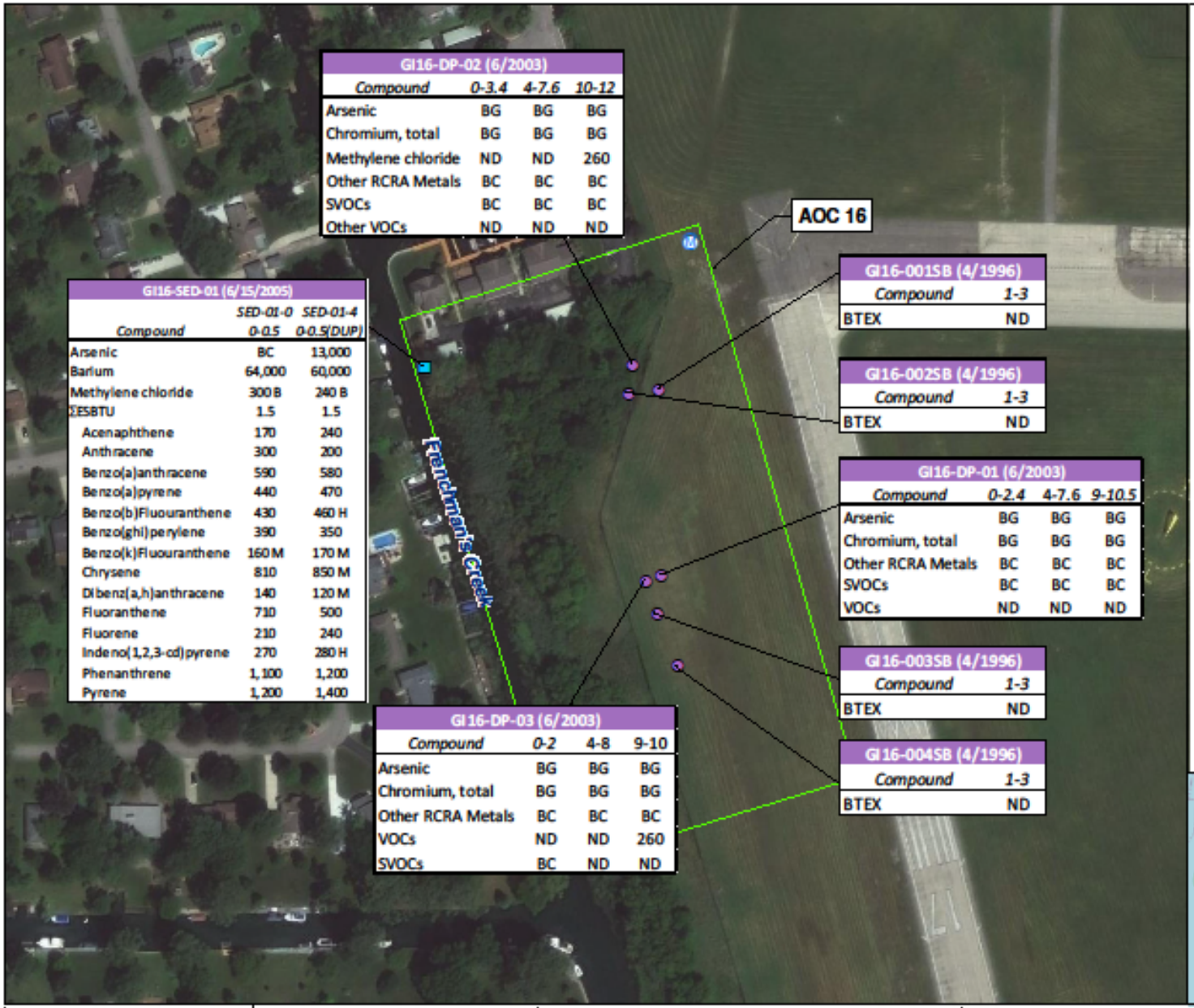
US Army Corps of Engineers
Louisville District

AOC 16 Sample Location Map

Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No. 2



Legend

- Area of Concern
- Soil Sample Location
- Sediment Sample Location
- Manhole

Notes:

1) Units in micrograms per kilogram (µg/kg)
2) Depth intervals in feet (shown in *italics*)
3) Concentrations above residential criteria or screening levels are shown.
4) Sediment risk characterization and management decisions are based on ∑ESBTU. Individual PAH concentrations are presented for informational purposes only.

B = Analyte detected in the associated Method Blank and/or estimated value
M = Manual Integration used to determine area response
H = Alternate peak selection upon analytical review
ND = Not Detected
BC = Below Criteria
BG = Below Background Levels

N W E S

0 0.04 Miles

PREPARED BY: AS CHECKED BY: LF DATE: April 2020

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US Army Corps of Engineers
Louisville District

AOC 16 Soil and Sediment Sampling Results Map
Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No. 3

APPENDIX A - GLOSSARY

Term	Definition
Administrative Record	The documents that form the basis for the selection of a response action compiled and maintained by the lead agency.
Area of Concern (AOC)	Environmentally sensitive or damaged areas subject to investigation.
Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA)	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986.
Chemical of Concern (COC)	A site-specific COPC that upon further evaluation is determined to be of concern to human health.
Chemical of Ecological Concern (COEC)	A site-specific COPEC that upon further evaluation is determined to be of concern to the environment.
Chemical of Potential Concern (COPC)	Site-specific chemical substance identified at the site that exceeds specified human health screening concentrations. A COPC is further evaluated to determine if it may or may not be of potential concern to human health.
Chemical of Potential Ecological Concern (COPEC)	Site-specific chemical substance identified at the site that exceeds specified ecological screening concentrations. A COPEC is further evaluated to determine if it may or may not be of potential concern to the environment.
Decision Document	A legal document issued following the Proposed Plan that sets forth the selected remedial decision for remedial action of a site as decided by the lead federal agency.
Exposure pathways	The way chemicals come into contact with the body. The most common routes of exposure are through the skin, by mouth, or by inhalation.
Formerly Used Defense Sites (FUDS)	facility or site which was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances, for which the Secretary of Defense shall carry out all response actions with respect to releases of hazardous substance from that facility or site.
Generic Residential Cleanup Criteria (GRCC)	The amount of a contaminant that can be present while limiting risk to a residential occupant to an acceptable level.
Groundwater	Water in a saturated zone or stratum beneath the surface of land or water .
Information Repository	Under CERCLA, an information repository is a collection of all the information related to a remedial action that has been made available to the public (40 *Code of Federal Regulations* 300.430), including public notices and background information. This contrasts with the administrative record, which contains only those documents that form the basis for selecting a response action.

Term	Definition
Michigan Department of Environment, Great Lakes, and Energy (EGLE)	The state agency responsible for enforcement of state laws protecting the environment in Michigan.
National Oil and Hazardous Substance Pollution Contingency Plan [also known asthe National Contingency Plan] (NCP)	The plan revised pursuant to 42 USC 9605 and found at 40 CFR 300 that sets out the plan for hazardous substance remediation under CERCLA.
No Action	No remedial action is necessary per theCERCLA process.
Proposed Plan	In the first step of the remedial decision selection process, the lead agency identifies the alternative that best meets the requirements in CERCLA 300.430(f)(1) and presents that alternative to the public in a Proposed Plan.The purpose of the Proposed Plan is to supplement the RI or Feasibility Study and provide the public with a reasonable opportunity to comment onthe Proposed Plan.
Public comment period	A reasonable time period, of at least 30 days, for the public to review andcomment on various documents and actions.
Receptor	Human being or nonhuman organism that might be exposed to a contaminant, by coming in contact with air, water, soil, or other material containing the contaminant.
Remedial action	An action taken to address a release or threatened release of hazardoussubstances that could affect public health or the environment.
Remedial Investigation (RI)	A process undertaken by the lead agency to determine the nature and extent of the problem presented by the release. The RI emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the feasibility study. The RI includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives.
Responsiveness Summary	A summary of oral and written public comments received during a publiccomment period. The responsiveness summary is a key part of the Decision Document, highlighting community concerns.
Residential vapor intrusion groundwater screening levels (GWVI-res)	An amount of a contaminant in groundwater that is not expected to cause adverse health effects for a residential occupant associated with vapor intrusion to indoor air. These screening levels were published by EGLE in 2013
Residential vapor intrusion soil screeninglevels (SVI-res)	An amount of a contaminant in soil that is not expected to cause adverse health effects for a residential occupant associated with vapor intrusion toindoor air. These screening levels were published by EGLE in 2013.
Risk Assessment	A process of evaluating the potential for adverse human health or ecologicaleffects attributable to site contamination.

Appendix B Abbreviations and Acronyms

AOC	Area of Concern
bgs	below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylenes
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
COC	Chemical of Concern
COEC	Chemical of Ecological Concern
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
DoD	Department of Defense
EEG	Ellis Environmental Group, LC
EGLE	Michigan Department of Environment, Great Lakes, and Energy
ERA	Ecological Risk Assessment
ESBTU	Equilibrium Partitioning Sediment Benthic Toxicity Unit
ft	foot or feet
FUDS	Formerly Used Defense Sites
GRCC	Generic Residential Cleanup Criteria
HHRA	Human Health Risk Assessment
ITR	Independent Technical Review
NASGI	Naval Air Station Grosse Ile
NCP	National Oil and Hazardous Substances Pollution Contingency Plan.
PAH	polynuclear aromatic hydrocarbon
RI	Remedial Investigation
SVOC	semi-volatile organic compound
SVI-res	2013 EGLE Residential soil vapor intrusion screening levels
TPH	total petroleum hydrocarbons
95% UCL	95 percent upper confidence limit of the mean
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
µg/kg	microgram(s) per kilogram

Appendix C References

Ellis Environmental Group, LC (EEG). May 2007. F i n a l Remedial Investigation Report Phases I and II, Former Naval Air Station Grosse Ile, MI.

Parsons Engineering Science, Inc (Parsons). September 1998. Expanded Field Investigation Final Report, Former Grosse Ile Naval Air Station / Nike Site D-51, Grosse Ile, Michigan.

Appendix D Data Comparison to EGLE 2013 Part 201 Criteria

Table 1 Chemicals Detected in Soil
AOC 16 - Former Sewage Treatment Plant
Former NASGI, Grosse Ile, MI

Location		Groundwater	Residential Infinite	Nonresidential	Residential	Nonresidential	Residential	Nonresidential	Soil Saturation	Residential Soil	Non-Residential	GI16-004SB	GI16-003SB	GI16-002SB	GI16-001SB	GI16-DPS-01	GI16-DPS-01	GI16-DPS-01	GI16-DPS-02
Sample Date		Surface Water	Source Volatile	Infinite Source	Particulate Soil	Particulate Soil	Direct Contact	Direct Contact	Concentration	Vapor Intrusion	Soil Vapor	04/05/96	04/05/96	04/05/96	04/05/96	06/30/03	06/30/03	06/30/03	06/30/03
Top Depth	Regional	Interface	Soil Inhalation	Volatile Soil	Inhalation	Inhalation	Criteria	Criteria	Screening Level	Screening Level	Intrusion	1	1	1	1	0	4	9	0
Bottom Depth	Background	Protection Criteria	Criteria	Inhalation Criteria	Criteria	Criteria					Screening Level	3	3	3	3	2.4	7.6	10.5	3.4
Metals																			
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA							8300	5200	6100	9500
Barium	172000	(G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA							70000	52000	61000	57000
Cadmium	2000	(G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA							140 B	500 U	500 U	270 B
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA							21000	12000	14000	16000
Lead	26200	(G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA							15000	8200	9300	29000
Mercury	500	50 (M); 1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA							32	16 B	13 B	46
SVOCs																			
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA							300 J	350 U	360 U	340 J
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA							320 J	350 U	360 U	390 J
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA							380 M	350 U	360 U	390 J
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA							240 J	350 U	360 U	200 J
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA							310 J	350 U	360 U	450 M
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA							180 J	350 U	360 U	390 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA							440	350 U	360 U	430
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA							760	350 U	360 U	860
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA							210 J	350 U	360 U	180 J
Phenanthrene	NA	2,100	1.60E+05	1.90E+05	6.70E+06	2.90E+06	1.60E+06	5.20E+06	NA	5,140	86,300					260 J	350 U	360 U	430
Pyrene	NA	ID	6.50E+08	7.80E+08	6.70E+09	2.90E+09	2.90E+07	8.40E+07	NA	64,700,000	1,090,000,000					670	350 U	360 U	710
VOCs																			
Methylene chloride	NA	940 (X)	2.10E+05	7.00E+05	6.60E+09	8.30E+09	1.30E+06	5.8E+6 (C)	2.30E+06	100	1,540					200 U	160 U	190 U	210 U
BTEX (Field Screening)												1.5 U	1.5 U	1.5 U	1.5 U				

Notes:
Regional Background values are based on Michigan Background Soil Survey (2015) by the Michigan Department of Natural Resources
Criteria included for relevant pathways.
All concentrations given in micrograms per kilogram (µg/kg).
Depths provided in feet below ground surface
Shaded/bolded values exceed one or more of the Generic Cleanup Numbers, Soil Vapor Intrusion (SVI) screening levels, or background (if background is more than the Generic Cleanup Numbers)
BTEX = Benzene, toluene, ethylbenzene, xylenes
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
-- = not analyzed/reported
Criteria abbreviations:
NLV = Not likely to volatiilize under most conditions.
NLL = Not likely to leach under most soil conditions.
NA = Criterion or value is not available or not applicable.
ID = Insufficient data to develop criterion.
C = The criterion developed under R 299.20 to R 299.26 exceeds the chemical specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or non-aqueous phase liquid to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.
DD = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.
G = Groundwater surface water interface (GSI) criterion depends on the water hardness of the receiving surface water. GSI criteria calculated using default hardness of 150 milligrams per liter (mg/L).
M = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected concentrations exceed 50,000 µg/kg.
X = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source (e.g., the Great Lakes)
Data validation flags
U = Not detected above indicated threshold (e.g., Limit of Detection).
B = Detected in associated blank (organics) or estimated concentration (inorganics).
J = Estimated concentration.
E = Detected above calibrated range.
M = Manual Integration used to determine area response

Table 1
Chemicals Detected in Soil
AOC 16 - Former Sewage Treatment Plant
Former NASGI, Grosse Ile, MI

Location												GI16-DPS-02	GI16-DPS-02	GI16-DPS-03	GI16-DPS-03	GI16-DPS-03
Sample Date												06/30/03	06/30/03	06/30/03	06/30/03	06/30/03
Top Depth	Regional	Groundwater Surface Water Interface	Residential Infinite Source Volatile Soil Inhalation	Nonresidential Infinite Source Volatile Soil Inhalation	Residential Particulate Soil Inhalation	Nonresidential Particulate Soil Inhalation	Residential Direct Contact	Nonresidential Direct Contact	Soil Saturation Concentration	Residential Soil Vapor Intrusion	Non-Residential Soil Vapor Intrusion	4	10	0	4	9
Bottom Depth	Background	Protection Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Criteria	Screening Level	Screening Level	Screening Level	8	12	2	8	10
Metals																
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA			5800	7200	6000	6900	5400
Barium	172000	(G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA			56000	66000	66000	50000	45000
Cadmium	2000	(G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA			130 B	140 B	110 B	550 U	520 U
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			13000	14000	17000	16000	13000
Lead	26200	(G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			10000	9500	15000	9200	8600
Mercury	500	50 (M); 1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA			13 B	13 B	42	11 B	14 B
SVOCs																
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			360 U	360 U	120 J	370 U	360 U
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA			360 U	360 U	130 J	370 U	360 U
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA			360 U	360 U	170 J	370 U	360 U
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA			360 U	360 U	350 U	370 U	360 U
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA			360 U	360 U	150 J	370 U	360 U
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA			360 U	360 U	350 U	370 U	360 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA			360 U	360 U	170 J	370 U	360 U
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA			360 U	360 U	370	370 U	360 U
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			360 U	360 U	350 U	370 U	360 U
Phenanthrene	NA	2,100	1.60E+05	1.90E+05	6.70E+06	2.90E+06	1.60E+06	5.20E+06	NA	5,140	86,300	360 U	360 U	190 J	370 U	360 U
Pyrene	NA	ID	6.50E+08	7.80E+08	6.70E+09	2.90E+09	2.90E+07	8.40E+07	NA	64,700,000	1,090,000,000	360 U	360 U	250 J	370 U	360 U
VOCs																
Methylene chloride	NA	940 (X)	2.10E+05	7.00E+05	6.60E+09	8.30E+09	1.30E+06	5.8E+6 (C)	2.30E+06	100	1,540	160 U	**260**	210 U	180 U	200 U
BTEX (Field Screening)																

Notes:
Regional Background values are based on Michigan Background Soil Survey (2015) by the Michigan Department of Natural Resources
Criteria included for relevant pathways.
All concentrations given in micrograms per kilogram (µg/kg).
Depths provided in feet below ground surface
Shaded/bolded values exceed one or more of the Generic Cleanup Numbers, Soil Vapor Intrusion (SVI) screening levels, or background (if background is more than the Generic Cleanup Numbers)
BTEX = Benzene, toluene, ethylbenzene, xylenes
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
-- = not analyzed/reported
Criteria abbreviations:
NLV = Not likely to volatilize under most conditions.
NLL = Not likely to leach under most soil conditions.
NA = Criterion or value is not available or not applicable.
ID = Insufficient data to develop criterion.
C = The criterion developed under R 299.20 to R 299.26 exceeds the chemical specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or non-aqueous phase liquid to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.
DD = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.
G = Groundwater surface water interface (GSI) criterion depends on the water hardness of the receiving surface water. GSI criteria calculated using default hardness of 150 milligrams per liter (mg/L).
M = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected concentrations exceed 50,000 µg/kg.
X = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source (e.g., the Great Lakes)
Data validation flags
U = Not detected above indicated threshold (e.g., Limit of Detection).
B = Detected in associated blank (organics) or estimated concentration (inorganics).
J = Estimated concentration.
E = Detected above calibrated range.
M = Manual Integration used to determine area response

Table 2
Chemicals Detected in Sediment
AOC 16 - Former Sewage Treatment Plant
Former NASGI, Grosse Ile, MI

	Ecological Screening Levels				Human Health Criteria					
Location Sample Date	Region V ESLs	Region III Freshwater Sediment	ORNL Secondary Chronic Values	ΣESBTU	Regional Background	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	GI16-SED-01 06/15/05	GI16-SED-01 06/15/05
Metals										
Arsenic	9790	9800	NA		22800	7,600	37,000	NA	6300	**13000**
Barium			NA		172000	3.70E+07	1.30E+08	NA	64000	60000
Cadmium	990	990	NA		2000	5.50E+05	2.10E+06	NA	670	560
Chromium	43400	43400	NA		55600	2.50E+06	9.20E+06	NA	15000	15000
Lead	35800	35800	NA		26200	4.00E+05	9.0E+5 (DD)	NA	16000	20000
Mercury	174	180	NA		500	1.60E+05	5.80E+05	NA	37 B	26 B
VOCs										
Methylene chloride	159		370		NA	1.30E+06	5.8E+6 (C)	2.30E+06	**300** B	**240** B
SVOCs/PAHs [a]										
Acenaphthene					NA	4.10E+07	1.30E+08	NA	170	240
Anthracene					NA	2.30E+08	7.30E+08	NA	300	200
Benzo(a)anthracene					NA	20,000	80,000	NA	590	580
Benzo(a)pyrene					NA	2,000	8,000	NA	440	470
Benzo(b)fluoranthene					NA	20,000	80,000	NA	430	460 H
Benzo(ghi)perylene					NA	2.50E+06	7.00E+06	NA	390	350
Benzo(k)fluoranthene					NA	2.00E+05	8.00E+05	NA	160 M	170 M
Chrysene					NA	2.00E+06	8.00E+06	NA	810	850 M
Dibenz(a,h)anthracene					NA	2,000	8,000	NA	140	120 M
Fluoranthene					NA	4.60E+07	1.30E+08	NA	710	500
Fluorene					NA	2.70E+07	8.70E+07	NA	210	240
Indeno(1,2,3-cd)pyrene					NA	20,000	80,000	NA	270	280 H
Phenanthrene					NA	1.60E+06	5.20E+06	NA	1100	1200
Pyrene					NA	2.90E+07	8.40E+07	NA	1200	1400
ΣESBTU [b]				1					**1.5**	**1.5**

Notes:
Regional Background values are based on Michigan Background Soil Survey (2015) by the Michigan Department of Natural Resources
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
-- = not analyzed/reported
All concentrations given in micrograms per kilogram (µg/kg).Criteria included for relevant pathways.
Depths provided in feet below ground surface
Shaded/bolded values exceed one or more of the Generic Cleanup Numbers, Soil Vapor Intrusion (SVI) screening levels, or background (if background is more than the Generic Cleanup Numbers)

Criteria abbreviations:
NLV = Not likely to volatilize under most conditions.
NA = Criterion or value is not available or not applicable.
NLL = Not likely to leach under most soil conditions.
ID = Insufficient data to develop criterion.
C = The criterion developed under R 299.20 to R 299.26 exceeds the chemical specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or non-aqueous phase liquid to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.
DD = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.
G = Groundwater surface water interface (GSI) criterion depends on the water hardness of the receiving surface water. GSI criteria calculated using default hardness of 150 milligrams per liter (mg/L).
M = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected concentrations exceed 50,000 µg/kg.
X = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source (e.g., the Great Lakes) and has been replaced by the value in the Generic Part 201 Criteria footnotes.

Data validation flags:
U = Not detected above the indicated threshold (e.g., Limit of Detection).
J = Estimated concentration.
M = Manual Integration used to determine area response
B = Detected in associated blank (organics) or estimated concentration (inorganics).
E = Detected above calibrated range

Appendix E ESBTU Procedure

The Remedial Investigation Report included a Risk Assessment. No chemicals of concern were identified in the risk assessment. Since there are no chemicals of concern present at AOC 16, no additional remedial action was required. The RI included recommendations for No Action. The No Further Decision is fully supported by the results of the risk assessment. No risks are likely using criteria for the Residential Land Use, which allows for a No Action determination.

As there is no suitable habitat at AOC 16, the ecological exposure pathway is incomplete. Therefore, no risk to ecological receptors was identified. Since completion of the RI, a potential pathway for ecological risks was evaluated to ensure no there are no potential ecological risks to aquatic ecological receptors from exposure to polycyclic aromatic hydrocarbon (PAHs) in sediment at AOC 16.

Sediment PAHs were evaluated following Procedures for Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures (USEPA, 2003). In this method, PAHs were evaluated as complete mixtures and were not evaluated as individual compounds. Toxicities of 16 individual PAHs within a sample (i.e. toxic units or TU) are summed (Σ) to calculate the ΣESBTU. This approach was re-affirmed by USEPA in 2012 (USEPA, 2012).

In calculating the sediment PAH ΣESBTU, ½ the detection limit was used for values reported as non-detect (i.e. U and UJ qualified data). ΣESBTUs were adjusted to the 90th confidence percentile. ΣESBTU calculations are shown in Table E-1. A ΣESBTU less than 1 is considered protective of the benthic community.

Considering that sediment ESBTUs were conservatively adjusted to a 90 percent confidence interval to provide a measure of conservatism, and considering that the ΣESBTU for sample GI16-SED1-0 (1.5) and GI16-SED1-4 (1.5) are nominally greater than 1, the likelihood of adverse effects to the benthic community are low and do not require any further action.

References:

USEPA, November 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. 359 EPA 600-R-02-013.

USEPA. December 2012. Equilibrium Partition Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Procedures for the Determination of the Freely Dissolved Interstitial Water Concentrations of Nonionic Organics. EPA 600-R-02-012.

Table E-1
ΣESBTU PAH Calculations
AOC 16 - Former Sewage Treatment Plant
Former NASGI, Grosse Ile, MI

		Sample ID	GI16-SED-01 FD				GI16-SED-01- FS			
		Location ID Sample Date	GI16-SED1-0 6/15/2005				GI16-SED1-4 6/15/2005			
		TOC (mg/kg)	53,000				53,000			
Parameter	**FCV (ug/g_{oc})**	**Maxi (ug/g_{oc})**	**Measured Conc. (ug/g dry wt.)**		**C_{OC} (ug/g_{oc})**	**ESBTU**	**Measured Conc. (ug/g dry wt.)**		**C_{OC} (ug/g_{oc})**	**ESBTU**
Acenaphthene	491	33400	0.17		3.21	0.007	0.24		4.53	0.009
Acenaphthylene	452	2400	0.042	U	0.40	0.001	0.04	U	0.38	0.001
Anthracene	594	1300	0.3		5.66	0.010	0.2		3.77	0.006
Benz(a)anthracene	841	4153	0.59		11.13	0.013	0.58		10.94	0.013
Benzo(a)pyrene	965	3840	0.44		8.30	0.009	0.47		8.87	0.009
Benzo(b)fluoranthene	979	2169	0.43		8.11	0.008	0.46		8.68	0.009
Benzo(k)fluoranthene	981	1220	0.16		3.02	0.003	0.17		3.21	0.003
Benzo(g,h,i)perylene	1095	648	0.39		7.36	0.007	0.35		6.60	0.006
Chrysene	844	826	0.81		15.28	0.018	0.85		16.04	0.019
Dibenz(a,h)anthracene	1123	2389	0.14		2.64	0.002	0.12		2.26	0.002
Fluoranthene	707	23870	0.71		13.40	0.019	0.5		9.43	0.013
Fluorene	538	26000	0.21		3.96	0.007	0.24		4.53	0.008
Indeno(1,2,3-cd)pyrene	1115	-	0.27		5.09	0.005	0.28		5.28	0.005
Naphthalene	385	61700	0.04	U	0.38	0.001	0.04	U	0.38	0.001
Phenanthrene	596	34300	1.1		20.75	0.035	1.2		22.64	0.038
Pyrene	697	9090	1.2		22.64	0.032	1.4		26.42	0.038
$\Sigma ESBTU_{FCV,16}$						0.176				0.181
Correction Factor for 90th Percentile						8.45				8.45
Calculated $\Sigma ESBTU_{FCV,34}$						**1.5**				**1.5**

Notes:

Prepared by: AMR 2/20/2019
Checked by: SEB 2/22/2019

A value of 1/2 the detection limit is used in the calculations for non-detects (U).

COC - organic carbon-normalized sediment concentration

Conc. - Measured PAH concentration in sediment

ESBTU - Equilibrium partitioning sediment benchmark toxic units, where the toxic units are based on final chronic values (FCVs).

FCV - Final Chronic Value (toxicity-based benchmark) (USEPA, 2003;2012).

MAXi - solid phase concentration based on the aqueous solubility of each compound

mg/kg - milligram per kilogram

$\Sigma ESBTU_{FCV}$ - Sum of toxic units for all PAHs in the sample.

TOC - Total Organic Carbon

U - Value is nondetect; the value shown is the detection limit.

ug /g - microgram per gram

ug /goc - microgram per gram organic carbon

Reference:

USEPA, 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection ofBenthic Organisms: PAH Mixtures. EPA 600-R-02-013. November.

USEPA. 2012. Equilibrium Partition Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Procedures for the Determination of the Freely Dissolved Interstitial Water Concentrations of Nonionic Organics. EPA 600-R-02-012. December.