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

PROPOSED PLAN
Area of Concern 15 - Former Nike Missile Magazines
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] 15, Former Nike Missile Magazines, 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 15 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 the 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 Decision for AOC 15. The USACE may modify the Decision based on new information or public comments. Therefore, 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 following reports: Contamination Evaluation Report (Foth & Van Dyke [F&VD], December 1991), Expanded Field Investigation Report (Parsons Engineering Science, Inc., September 1998), Remedial Investigation Report Quarry Lake Sediment and Surface Water Sampling Supplement (Ellis Environmental Group, LC [EEG], January 2005), Remedial Investigation Report for AOCs 5 and 15 (EEG, February 2005), and Final Ecological Risk Assessment: Areas of Concern 5 and 15 (USACE, July 2008)[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 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 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 15. AOC 15 is the site of the former Nike Missile Magazines. AOC 15 includes the entire Nike D-51 missile launch area except for the area of AOC 5 (**Figure 2**). AOC 15 is located east of the airport, west of East River Road, on property that is now part of the Gibraltar Bay Unit of the Detroit River International Wildlife Refuge.

Construction of the Nike D-51 missile launch area occurred from 1954 to 1956. To accommodate the construction plans, the site of AOC 15 was backfilled with soil, dredging, gravel, and construction debris to elevate the ground surface above the water level. The Nike D-51 missile launch area contained the following structures or features:

- Three missile magazines: Three underground magazines were used to store Nike Ajax missiles. The magazines extended downward approximately 18 feet (ft) below ground surface (bgs) and were connected by underground tunnels and control rooms. Each magazine was equipped with an elevator to raise and lower the missiles and the hydraulic casing extended vertically beneath each magazine. Each magazine was equipped with a large sump that collected water, waste cleaning solvents, paints, and hydraulic fluids. Originally, the sumps discharged to the ground surface along the west side of the magazines. Later, the sump lines were extended to discharge into a drainage swale leading into an embayment of the Detroit River.
- Missile Assembly and Testing Building (MATB) and Generator Building: The MATB and the Generator Building were located next to one another. The MATB was used to assemble missile components and conduct general maintenance activities such as painting, stripping, and coating parts with anti-corrosion materials. Sanitary waste lines from the MATB led to a septic tank located to the west of the MATB. The septic system sand filter pit was originally located west of the septic tank but was later relocated to the north of the MATB. The Generator Building was used to generate a backup power supply in the event of an outage. No information was found to indicate whether the generator was fueled from an underground storage tank (UST) or an aboveground storage tank. A heating oil UST was located between the MATB and Generator Building and is designated as AOC 5.

- Missile Fueling Area: The Nike Ajax missile was equipped with three high-explosive warheads and was launched using a solid fuel booster. The missile was sustained by a liquid-fueled motor using a combination of inhibited red fuming nitric acid, 1,1-dimethylhydrazine, and jet propellant (JP)-4. The missile was joined to the booster in the missile fueling area. A jib crane was used to assist with missile fueling and assembly. As a safety precaution, the Missile Fueling Area was bordered on three sides by earthen berms rising 10 ft above ground surface. The Missile Fueling Area also contained a wash station used to wash down missiles after fueling. The pavement of the Missile Fueling Area was sloped to enable wash water to flow south and out towards the Detroit River.
- Ready Building: The Ready Building provided space for personnel to wait to be called for drills and alerts. A transformer was located off the southeast corner of the building, and a septic system was located west of the building. Paints, solvents, and cleaning materials may have been disposed into the septic system of the Ready Building.
- Acid Storage Shed: The Acid Storage Shed was used to store acid for the missile batteries. As the missile batteries were generally changed out every month, the used batteries may have also been temporarily stored in this building. A shower with an underlying gravel sump was located on the west side of the shed and may have been used to wash down equipment and personnel. There was neither an acid neutralizing pit nor other acid disposal facility identified on site plans. The gravel sump may have been a potential location for dumping of the small quantities of acid waste containing dissolved lead from discarded batteries. Information regarding the Acid Storage Shed was obtained from the Remedial Investigation (RI) Report.
- Quarry Lake: The northwest region of AOC 15 includes a lake that was operated as a quarry in the mid-1800s. Quarry Lake, approximately 2.9 acres in size, is fed by a drainage feature located on the north side of the lake. A culvert located on the southeast side of the lake leads to a drainage swale that conducts overflow from the lake into Gibraltar Bay of the Detroit River. The lake is estimated to be less than 12 ft deep in most areas. In the mid-1980s, several drums were reportedly removed from the shoreline on the northeastern edge of Quarry Lake.
- Temporary Drum and Aboveground Storage Area: The area to the east of the northernmost missile magazine was used for the temporary storage of drums and tanks. Drums and tanks originally stored at the Quonset Hut (AOC 20) were relocated to this area and temporarily staged until being removed from the site.

The Nike D-51 site structures were razed by the USACE between 1991 and 1993. Quarry Lake remains as an amenity to the Gibraltar Bay Unit of the Detroit River International Wildlife Refuge. The approximate locations of the former site features are shown on **Figure 2.**

The details of the investigations conducted at AOC 15 are presented in the following USACE, contractor-prepared documents: Contamination Evaluation Report (F&VD 1991), Expanded Field Investigation Report (Parsons, 1998), Remedial Investigation Report Quarry Lake Sediment and Surface Water Sampling Supplement Ellis Environmental Group (EEG, 2005), Remedial Investigation Report for AOCs 5 and 15

(EEG, 2005), and Final Ecological Risk Assessment: Areas of Concern 5 and 15 (USACE, 2008). Investigative activities included collection of soil, groundwater, surface water, sediment, and soil gas samples. EGLE Part 201 criteria were used for the data evaluation.

3.0 SITE CHARACTERISTICS

AOC 15 occupies approximately 40.5 acres located at the southern tip of Grosse Ile, east of the airport, and west of East River Road (**Figure 1**). AOC 15 is owned by the U.S. Fish and Wildlife Service and is part of the Gibraltar Bay Unit of the Detroit River International Wildlife Refuge, which was established by the Detroit River International Wildlife Refuge Establishment Act for the conservation of fish and wildlife and compatible fish and wildlife dependent recreation. The Gibraltar Bay Unit of the Detroit River International Wildlife Refuge is open to the public and includes trails, a photography blind, and an observation deck. The AOC 15 area includes coastal wetland, meadow, prairie, and upland habitats.

Soil at AOC 15 consists of fill material and glacial clayey lacustrine deposits. Soil borings were completed to a maximum depth of 24 ft bgs. Groundwater saturated conditions were encountered at depths ranging from approximately 7 to 16 ft bgs. The site groundwater elevations appear to be influenced by the Detroit River stage. Based on groundwater elevations measured on 16 October 2003, groundwater flow is in a southerly direction with variations from southwest to southeast.

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 varied from less than 10 ft near Quarry Lake to 18.3 ft at the southern region of AOC 15.

4.0 SITE INVESTIGATIONS

Environmental investigations were performed to evaluate the nature and extent of potential contamination associated with the former Nike Missile Magazines and ancillary areas. Multiple sampling events were conducted at AOC 15 between 1990 and 2004. One monitoring well was installed, one surface water sample was collected from Quarry Lake, and four soil samples were collected in 1990 as part of a Contamination Evaluation (F&VD, 1991). Three temporary well points, five soil samples and one quality control duplicate soil sample were collected in 1996 as part of an Expanded Field Investigation (Parsons, 1998). An RI of AOC 15 was conducted in multiple phases from June 2002 to November 2004 (EEG, 2005), including collection of soil samples from 19 sampling locations, installation, and sampling of three piezometers and three bedrock groundwater monitoring wells, soil gas sampling, and collection of six sediment and three surface water samples from Quarry Lake. The AOC 15 sampling locations (excluding soil gas locations) are shown on **Figure 3**. Soil gas sampling locations are shown on **Figure 4.**

The AOC 15 data evaluated in the RI were collected 16 to 30 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 EGLE 2013 Part 201 criteria for sampling locations within the AOC 15 boundaries 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.

Soil samples were analyzed for one or more of the following: volatile organic compounds (VOCs); benzene, toluene, ethylbenzene, xylenes (BTEX) using a field gas chromatograph; semi-volatile organic compounds (SVOCs); polynuclear aromatic hydrocarbons (PAHs); total petroleum hydrocarbons (TPH), Resource Conservation and Recovery Act (RCRA) metals; chromium and lead; chromium VI; polychlorinated biphenyls (PCBs); and pesticides. The RCRA metals list includes arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. The following chemicals of potential concern (COPCs) were detected in the soil samples at concentrations exceeding the EGLE Part 201 Generic Residential Cleanup Criteria (GRCC) or the EGLE 2013 Residential Soil Vapor Intrusion Screening Levels (SVI- res): chromium, selenium, silver, benzo(a)pyrene, fluoranthene, phenanthrene, dibenzofuran, and methylene chloride. GRCC are more conservative than the Generic Non-Residential Cleanup Criteria, and are considered protective for residential, commercial, and industrial users. A summary of the soil analytical data is provided in **Figure 5**.

Groundwater samples were analyzed for VOCs, SVOCs, RCRA metals or chromium and lead. Chemicals were not detected in groundwater at concentrations exceeding vapor intrusion screening levels. Chemicals identified in groundwater at concentrations exceeding EGLE groundwater surface water interface criteria include lead, chromium, and mercury. A summary of the groundwater analytical data is provided in **Figure 6**.

Soil gas samples were analyzed using a field gas chromatograph for BTEX, methyl tertiary butyl ether, trichloroethene, vinyl chloride, tetrachloroethylene, 1,1-dichloroethene, and acetone. Tetrachloroethylene, 1,1-dichloroethene, and toluene were detected. A summary of the soil gas data is provided in **Figure 4**.

The sediment samples were analyzed for VOCs, SVOCs, PCBs, TPH, RCRA metals, copper, and zinc. Arsenic was found to be consistent with area background levels. No chemicals were detected in the sediments at concentrations that exceed both background and the EGLE Part 201 direct contact criteria. The surface water samples were screened for PAHs. Chemicals were not detected in the surface water at concentrations that exceed the EGLE Part 201 criteria. EGLE has not issued sediment quality criteria protective of aquatic life but does recognize MacDonald et al. (2000) Probable Effects Concentrations (PECs) as effects-based screening values. As shown in **Table 3**, sediment concentrations are less than PECs. No chemicals were detected in the surface water at concentrations that exceed Rule 57 Surface Water Quality Values (February 2020) for human health cancer and non-cancer drink values, or final chronic values for aquatic life (**Table 4**). A summary of the Quarry Lake sediment and surface water analytical data is provided in **Figure 7**.

A geophysical survey of Quarry Lake was conducted in 1999 for the USEPA. The lake was scanned using magnetic and ground-penetrating radar scanning sonar methodologies. Twenty-four discrete anomalies were identified and further investigated. The findings included one 55-gallon drum with its lid removed, a motor, a crane, a few pipes, and unidentifiable ferromagnetic debris. Based upon these findings, USEPA concluded that no wide-scale dumping of debris had occurred.

Based on the results and findings of the RI Report, a No Action determination was made for AOC 15. The Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA), summarized in Section 6.0, indicated No Action was 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 former NASGI site. This Proposed Plan exclusively addresses AOC 15. 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 15. The No Action determination was made based on the results and findings of the RI. No effects to human health or the environment were identified as a result of former operations at AOC 15.

6.0 SUMMARY OF RISK ASSESSMENTS

An HHRA was completed as part of the Final Remedial Investigation Report for AOCs 5 and 15 (EEG, 2005). The HHRA compared site concentrations of soil, surface water, and groundwater to applicable EGLE Part 201 Residential and Non-residential criteria. Based on the results of the HHRA, No Action is warranted. This finding was supported by a comparison of site data to 2013 EGLE criteria and 2020 Rule 57 Surface Water Quality Values. An ERA was completed in 2008 (USACE, 2008). The ERA compared site concentrations to effects thresholds protective of ecological health. Based on the results of the ERA and a comparison of surface water data to 2020 Rule 57 final chronic values for aquatic life, No Action was warranted. The sections that follow further describe the HHRA and ERA for the site.

6.1 Land Use

AOC 15 is part of the Gibraltar Bay Unit of the Detroit River International Wildlife Refuge. The property is owned by the U.S. Fish and Wildlife Service and is preserved by law for fish and wildlife and fish and wildlife-compatible public uses. Personnel and volunteers periodically work on the site to maintain trails, mow grass, remove invasive plants, and pick up litter. The Gibraltar Bay Unit of the Detroit River International Wildlife Refuge is open to the public daily from dusk to dawn. The site includes trails, a photography blind, and an observation deck.

6.2 Human Health Risk Assessment

A HHRA was completed as part of the Final Remedial Investigation Report for AOCs 5 and 15 (EEG, 2005). The HHRA identified several metals, PAHs, and VOCs concentrations that were greater than the 2002 EGLE Part 201 criteria in soil at AOC 15. Vapor intrusion was considered to be an incomplete (irrelevant) exposure

pathway since no enclosed buildings designed for human occupancy are expected based upon site use as a wildlife refuge.

The HHRA evaluated direct contact and inhalation of particulate exposure pathways. Based upon the data evaluation for relevant exposure pathways, arsenic, benzo(a)pyrene, and lead were retained as a COPCs. 95 percent upper confidence limits (95% UCL) of mean COPC concentrations were calculated to estimate exposure point concentrations. The 95% UCLs for benzo(a)pyrene and lead were determined to meet screening thresholds. The arsenic 95% UCL exceeded the screening threshold, but there was insufficient evidence to conclude site concentrations were elevated relative to background concentrations.

Lead and manganese were identified at concentrations greater than the 2002 Part 201 drinking water criteria but were eliminated from further evaluation because the dissolved concentrations were low, and water beneath the site will not be used for drinking water. The HHRA identified no COCs, and thus concluded that No Action was warranted.

The EGLE Part 201 criteria were revised in 2013 subsequent to the completion of the Final RI Report. Therefore, the analytical results for sampling locations within the AOC 15 boundaries were compared to the 2013 EGLE Part 201 criteria and to the 2013 EGLE Soil Vapor Intrusion Screening Levels (**Appendix D**). Per the RI Report, all data were considered to be of sufficient quality to be used. COPCs identified through this comparison for the relevant exposure pathways are consistent with the HHRA. No exceedances of Part 201 criteria were observed for surface water and sediment samples collected from Quarry Lake, except arsenic in sediment which was found to be consistent with background. No chemicals were detected in the surface water at concentrations that exceed Rule 57 Surface Water Quality Values (February 2020) for human health cancer and non-cancer drink values (**Table 4**).

Because the HHRA identified no COCs and because subsequent assessment identified no additional COPCs, No Action is warranted from a human health perspective.

6.3 Ecological Risk Assessment

An ERA was completed in 2008 (USACE, 2008). As described in the ERA, sampling conducted at Quarry Lake in 2004 indicated there was no contamination in surface water or sediment, so these media were eliminated as potential exposure points for ecological receptors. The ERA also evaluated ingestion of contaminated soil or food by terrestrial organisms. Terrestrial food chain exposures for cadmium, chromium, and lead required further evaluation. Three wildlife receptors - short-tailed shrew, American robin, and red-tailed hawk - were evaluated based on their representativeness as upper level consumers. In addition, these receptors are very common throughout the region and the site.

The evaluation determined the concentrations were less than effects thresholds for wildlife. No effects to plants (e.g., areas void of vegetation or areas with discolored plants) were observed. The ERA found that there were no chemicals of ecological concern (COECs) on the former Nike D-51 Site (i.e., AOC 15 and AOC 5). Sediment ecological toxicity values have not changed since the ERA was completed. Rule 57 Surface Water Quality Values were re-issued in February 2020. No COECs were identified in the surface water based on Rule 57 final chronic values for aquatic life (**Table 4**). Because the ERA identified no COECs, and because subsequent

screenings of surface water and sediment identified no chemicals greater than ecological screening values, 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. A No Action Alternative is proposed. Based on the findings of the RI, No Action is required for AOC 15 for the protection of human health and the environment. The No Action determination indicates that AOC 15 is useable for all Land Uses and no restriction to limit/reduce exposure is needed for relevant pathways. The USACE, in coordination with EGLE, will finalize the Decision for AOC 15 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 15. 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 Decision of No Action 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 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 memorialize the Decision and will be included in the Administrative Record file. USACE and the EGLE encourage the public to review the Administrative Record file for AOC 15, submit comments, and attend the public meeting.

LIST OF FIGURES

Legend

Area of Concern

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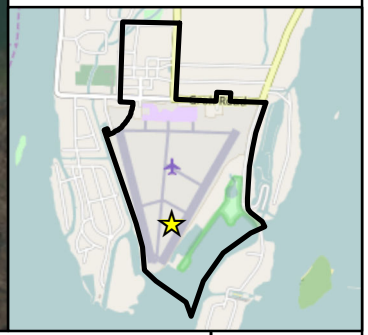

PREPARED BY: AS **CHECKED BY:** LF	**DATE:** June 2017	
IMAGERY SOURCE: © OpenStreetMap (and) contributors, CC-BY-SA Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		
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US Army Corps of Engineers
Louisville District

AOC 15 Site Location Map

Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No.
1

Legend

- Former Site Features
- Area of Concern 15
- Area of Concern 5 (excluded)

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PREPARED BY: KH **CHECKED BY:** LF **DATE:** February, 2019

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

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US Army Corps of Engineers

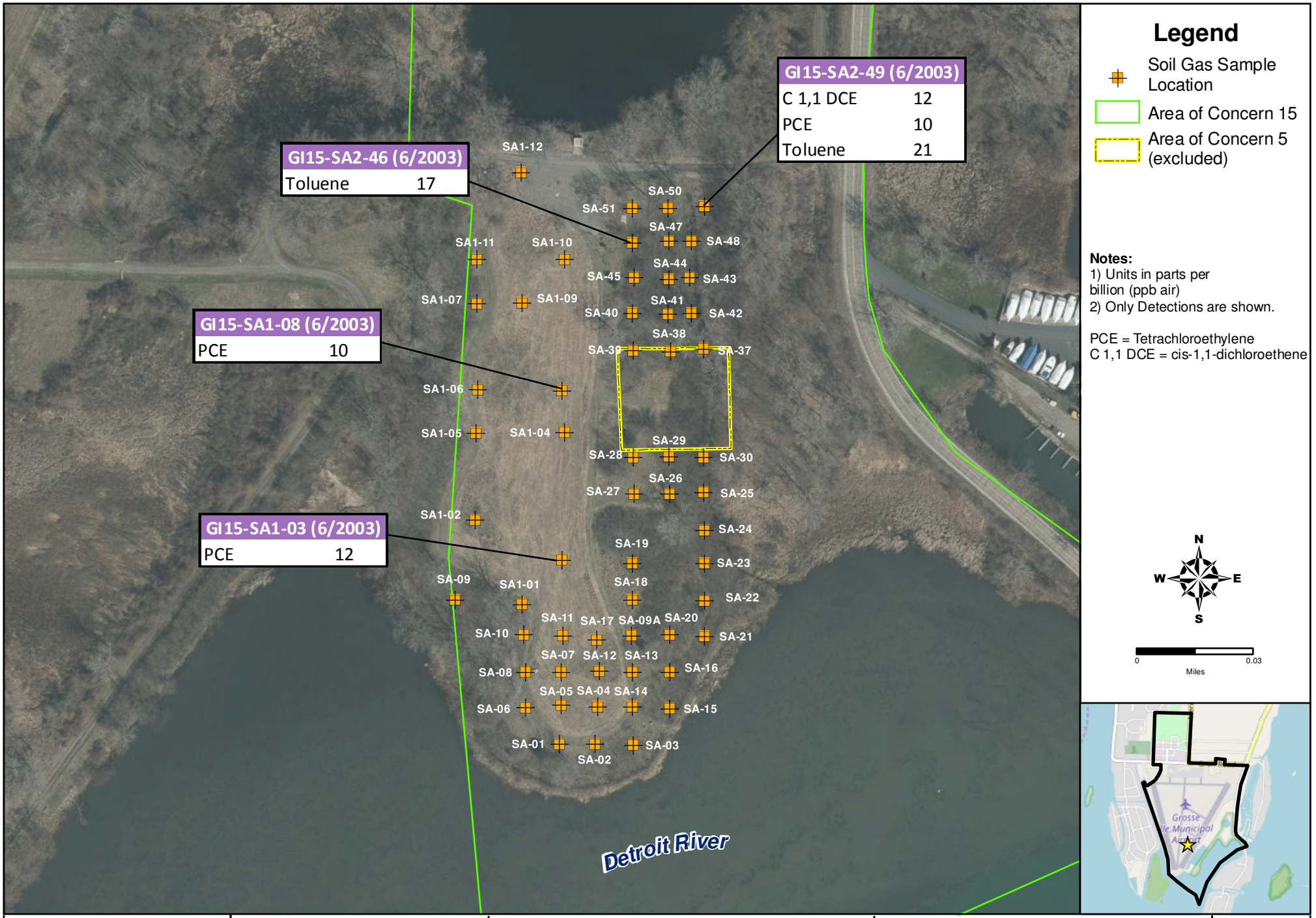
US Army Corps of Engineers
Louisville District

AOC 15 Former Site Features Location Map

Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No.
2

PREPARED BY: AS **CHECKED BY:** LF **DATE:** February, 2019 **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:\Grosselle\a_mxd\AOC 15\Sample_Location_Map_AOC15_170822.mxd	US Army Corps of Engineers Louisville District	**AOC 15 Soil, Sediment, and Water Sample Location Map** Former NASGI Grosse Ile, Wayne County, Michigan	**Figure No.** **3**



PREPARED BY: AS **CHECKED BY:** LF	**DATE:** March, 2019	US Army Corps of Engineers Louisville District
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		
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AOC 15 Soil Gas Sample Location and Results Map
Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No.
4

GI15-DP-05 (6/2003)		
Compound	*0 - 1*	*1 - 1.75*
Metals		
Selenium	1,900	1,700
SVOCs/PAHs	bc	bc
VOCs	bc	bc

GIS-SS07 (5/1990)	
Compound	*2.5 - 3*
TPH	39,000
Metals	bc
PESTICIDES	bc
VOCs	bc

GI15-DP-04 (6/2003)		
Compound	*0 - 3*	*3 - 3.5*
Metals	bc	bc
SVOCs/PAHs	bc	bc
VOCs	bc	bc

GI15-DP-03 (6/2003)		
Compound	*0 - 2*	*2 - 3*
Metals		
Chromium	bc	380,000
SVOCs/PAHs	bc	bc
VOCs	bc	bc

GI15-DP-03 (2/2004)		
Compound	*0 - 2*	*2 - 4*
Metals		
Chromium VI	<2200	<2500

GI15-DP-06 (6/2003)			
Compound	*0 - 3*	*4 - 6.5*	*8 - 10*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
VOCs	bc	bc	bc

GIS-SS06 (5/1990)	
Compound	*2.5 - 3*
TPH	8200
Metals	bc
VOCs	bc

GI15-MW-01D (6/2003)			
Compound	*0 - 2*	*4 - 6*	*8 - 10*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
Benzo(a)pyrene	bc	4000	2300
Fluoranthene	bc	9100	bc
Phenanthrene	bc	8300	bc
Dibenzofuran	bc	760	bc
VOCs	bc	bc	bc

GI15-WP001 (4/1996)	
Compound	*15 - 17*
BTEX	bc

GI15-DP-02 (6/2003)			
Compound	*0 - 3*	*3 - 3.8*	*5 - 8*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
VOCs	bc	bc	bc

GI15-DP-02 (2/2004)	
Compound	*0 - 2*
Metals	
Chromium VI	<2500

GIS-SS05 (5/1990)	
Compound	*2.5 - 3*
TPH	<17000
Metals	bc
PESTICIDES	bc
VOCs	bc

GI15-MW-02D (6/2003)		
Compound	*0 - 1*	*4 - 4.8*
Metals	bc	bc
SVOCs/PAHs	bc	bc
VOCs	bc	bc

GI15-DP-10 (6/2003)			
Compound	*0 - 3*	*3 - 3.5*	*6 - 6.8*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
VOCs	bc	bc	bc

GI15-WP003 (4/1996)	
Compound	*12 - 14*
BTEX	bc

GI15-WP002 (4/1996)		(8/1996)	
Compound	*0 - 0.5*	*10 - 12*	*10 - 12*
Metals	bc	NS	NS
SVOCs/PAHs	NS	bc	NS
VOCs	NS	bc	NS
BTEX	NS	NS	bc

GIS-SB04 (5/1990)	
Compound	*15 - 17*
VOCs	bc

GI15-MW-03D (6/2003)				
Compound	*0 - 3*	*4 - 5*	*6 - 7*	*15 - 16*
Metals				
Chromium	bc	bc	2,100,000	bc
Silver	bc	bc	1,700	bc
SVOCs/PAHs	bc	bc	bc	bc
VOCs	bc	bc	bc	bc

GI15-DP-07 (6/2003)			
Compound	*0 - 3*	*3 - 3.6*	*6 - 7*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
VOCs	bc	bc	bc

GI15-SB01 (7/2003)	
Compound	*0.5 - 1*
Metals	bc
SVOCs/PAHs	bc
VOCs	bc

GI15-DP-09 (6/2003)			
Compound	*0 - 3*	*3 - 3.5*	*7 - 7.5*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
VOCs	bc	bc	bc

GI15-DP-07 (2/2004)	
Compound	*0 - 2*
Metals	
Chromium VI	<2600

GI15-DP-01 (6/2003)			
Compound	*0 - 3*	*3 - 6.5*	*7 - 9*
Metals	bc	bc	bc

GI15-DP-08 (6/2003)			
Compound	*0 - 3*	*3 - 3.7*	*7 - 8.5*
Metals	bc	bc	bc
SVOCs/PAHs	bc	bc	bc
VOCs			
Methylene chloride	180	200	200

GI15-DP-09 (2/2004)	
Compound	*0 - 2*
Metals	
Chromium VI	<2400

AOC 15

Detroit River

Legend

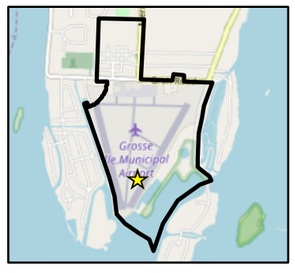
- Monitoring Well Location
- Piezometer Sample Location
- Sediment Sample Location
- Soil Sample Location
- Surface Water Sample Location
- Well Point Sample Location
- Area of Concern 15
- Area of Concern 5 (excluded)

Notes:
1) Depth intervals in feet (shown in *italics*)
2) Units in micrograms per kilogram (µg/kg)
3) Concentrations above residential criteria or screening levels are shown.

TPH = Total Petroleum Hydrocarbon
SVOCs/PAHs = Semi Volatile Organic Compounds/Polycyclic Aromatic Hydrocarbon
VOCs = Volatile Organic Compounds
bc = Below Criteria

N W E S

0 0.06
Miles



PREPARED BY: AS **CHECKED BY:** LF **DATE:** February, 2019

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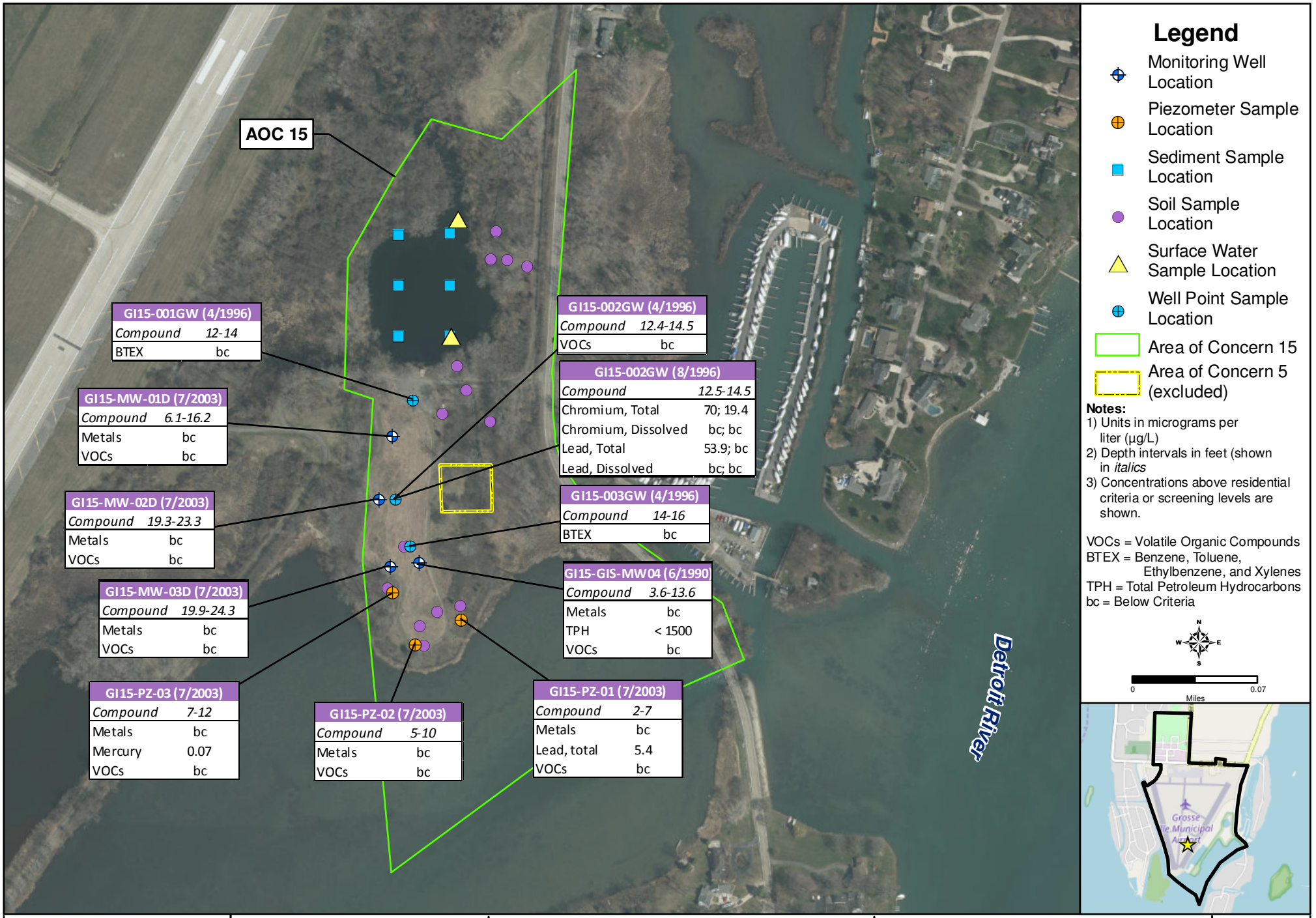
File: G:\Grosselle\a_mxd\AOC 15\Soil_Results_Map_AOC15.mxd

US Army Corps of Engineers
Louisville District

AOC 15 Soil Results Map
Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No.
5



Legend

- Monitoring Well Location
- Piezometer Sample Location
- Sediment Sample Location
- Soil Sample Location
- Surface Water Sample Location
- Well Point Sample Location
- Area of Concern 15
- Area of Concern 5 (excluded)

Notes:

1) Units in micrograms per liter (µg/L)
2) Depth intervals in feet (shown in *italics*
3) Concentrations above residential criteria or screening levels are shown.

VOCs = Volatile Organic Compounds
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
TPH = Total Petroleum Hydrocarbons
bc = Below Criteria

N W E S

0 0.07 Miles

PREPARED BY: AS **CHECKED BY:** LF **DATE:** March, 2019

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

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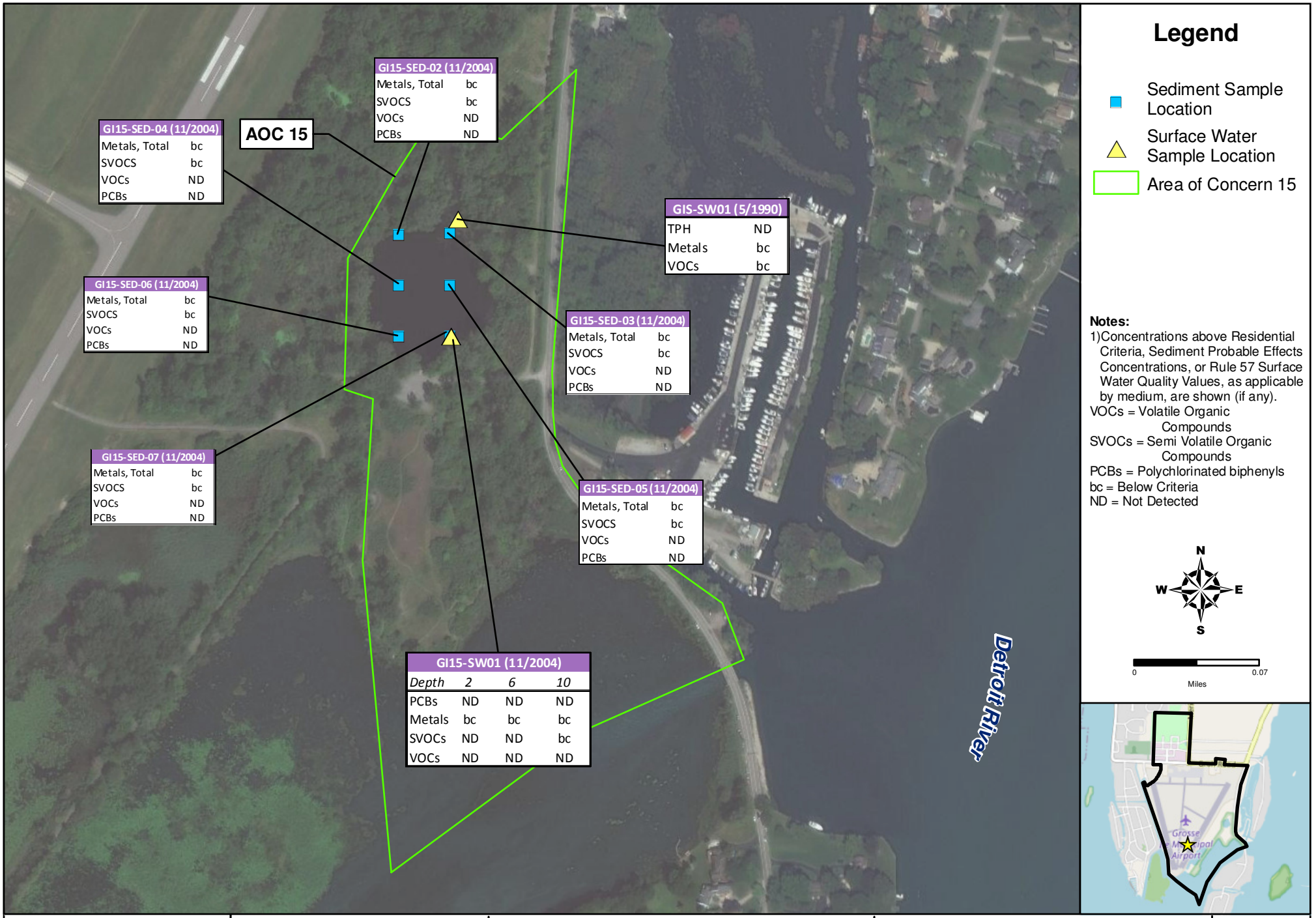
US Army Corps of Engineers
Louisville District

AOC 15 Groundwater Results Map

Former NASGI
Grosse Ile, Wayne County, Michigan

Figure No. 6



Legend

- Sediment Sample Location
- Surface Water Sample Location
- Area of Concern 15

Notes:

1) Concentrations above Residential Criteria, Sediment Probable Effects Concentrations, or Rule 57 Surface Water Quality Values, as applicable by medium, are shown (if any).

VOCs = Volatile Organic Compounds

SVOCs = Semi Volatile Organic Compounds

PCBs = Polychlorinated biphenyls

bc = Below Criteria

ND = Not Detected

N W E S

0 0.07 Miles

PREPARED BY: DJ **CHECKED BY:** LF **DATE:** April, 2020

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:\Grosselle\a_mxd\AOC 15\SW_Sed_Results_Apr2020_Map_AOC15.mxd

US Army Corps of Engineers

Louisville District

AOC 15 Surface Water and Sediment Results Map

Former NASGI

Grosse Ile, Wayne County, Michigan

Figure No. 7

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 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
COPEC	Chemical of Potential Ecological Concern
COPC	Chemical of Potential Concern
DoD	Department of Defense
EEG	Ellis Environmental Group, LC
EGLE	Michigan Department of Environment, Great Lakes, and Energy
ERA	Ecological Risk Assessment
F&VD	Foth & Van Dyke
ft	foot or feet
FUDS	Formerly Used Defense Sites
GRCC	Generic Residential Cleanup Criteria
HHRA	Human Health Risk Assessment
ITR	Independent Technical Review
JP	jet propellant
MATB	Missile Assembly and Testing Building
NASGI	Naval Air Station Grosse Ile
NCP	National Oil and Hazardous Substances Pollution Contingency Plan.
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEC	Probable Effects Concentration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RSL	Regional Screening Level
SVOC	semi-volatile organic compound
SVI-res	2013 EGLE Residential soil vapor intrusion screening levels
TPH	total petroleum hydrocarbon
95% UCL	95 percent upper confidence limit of the mean
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

Appendix C References

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MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. *Archives of Environmental Contamination & Toxicology* 39:20-31.

Parsons Engineering Science, Inc (Parsons). March 1998. Expanded Field Investigation Temporary Well Point Installation Plan for the Former Grosse Ile Naval Air Station / Nike Site D-51, Grosse Ile, Michigan.

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Public Law 107-91. 21 December 2001. Detroit River International Wildlife Refuge Establishment Act. 115 Stat. 894.

USACE. July 2008. Final Ecological Risk Assessment: Areas of Concern 5 and 15.

Appendix D Data Comparison to EGLE 2013 Part 201 Criteria

Table 1 Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location													GIS-SB04	GIS-SS05	GIS-SS06	GIS-SS07	GI15-WP001	GI15-WP002	GI15-WP002
Sample ID	**Regional Background**	**Groundwater Surface Water Interface Protection Criteria**	**Residential Infinite Source Volatile Soil Inhalation Criteria**	**Nonresidential Infinite Source Volatile Soil Inhalation Criteria**	**Residential Particulate Soil Inhalation Criteria**	**Nonresidential Particulate Soil Inhalation Criteria**	**Residential Direct Contact Criteria**	**Nonresidential Direct Contact Criteria**	**Soil Saturation Concentration Screening Level**	**Residential Soil Vapor Intrusion Screening Level**	**Non-Residential Soil Vapor Intrusion Screening**		GIS-SB04	GIS-SS05	GIS-SS06	GIS-SS07	GI15-001SB	GI15-002SS	GI15-002SB
Sample Date													05/24/90	05/21/90	05/21/90	05/21/90	04/02/96	04/05/96	04/05/96
Top Depth													15	2.5	2.5	2.5	15	0	10
Bottom Depth													17	3	3	3	17	0.5	12
TPH																			
Total Petroleum Hydrocarbons														17000 U	8200	39000			
Metals																			
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA					4000	4200	3400			
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA					30000	87000	66000			
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA					500 U	600 U	600 U		800	
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA					16000	15000	10500		17100	
Chromium VI																			
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA					12000	11000	12000		10100	
Mercury	500	50 (M); 1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA					100 U	100 U	100 U			
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA					300 U	400 U	400 U			
Silver	1,000	100 (M); 27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA					1000 U	1100 U	1100 U			
Pesticides																			
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA					5.2		1.1 U			
SVOCs																			
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000								2300 U
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000								2300 U
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000								2300 U
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA										2300 U
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA										2300 U
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA										2300 U
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA										2300 U
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA										2300 U
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA										2300 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA										2300 U
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA										2300 U
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230								2300 U
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA										2300 U
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000								2300 U
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA										2300 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								2300 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								2300 U
VOCs																			
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000	14	11 U	11 U	13 U				7 J
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000	130 B	7 J	6 J	24				27
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200	13 U	11 U	1 J	13 U				7 U
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800	5 J	5 U	6 U	6 U				2 J
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340	6 U	0.9 J	2 J	3 J				7 U
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990	6 U	0.8 J	2 J	6 U				7 U
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	19 B	3 BJ	11 B	5 J				13
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.00E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000	6 U	2 J	3 J	3 J				7 U
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890	2 J	4 J	11	5 J				7 U
BTEX Field Screening																			
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990						1.5 U		
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000						1 U		

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: 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
TPH = Total petroleum hydrocarbons
-- = 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 screening levels

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).
- T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
- 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

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.

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location																		
Sample ID	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-WP002	GI15-WP003	GI15-DP-01	GI15-DP-01	GI15-DP-01	GI15-DP-02	GI15-DP-02
												GI15-002SB	GI15-003SB	GI15-DP-01-0	GI15-DP-01-3	GI15-DP-01	GI15-DP-02-0	GI15-DP-02-3
Sample Date												08/20/96	04/02/96	06/20/03	06/20/03	06/20/03	06/19/03	06/19/03
Top Depth												10	12	0	3	7	0	3
Bottom Depth												12	14	3	6.5	9	3	3.8
TPH																		
Total Petroleum Hydrocarbons																		
Metals																		
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA								4600	7300
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA								54000	64000
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA								460 B	420 B
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			1800 B		12000	17000	16000	12000	17000
Chromium VI																		
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			2500		59000	11000	7800	19000	9400
Mercury	500	1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA								20 B	19 U
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA								1000 B	600 B
Silver	1,000	27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA								1000 U	990 U
Pesticides																		
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA									
SVOCs																		
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000						390 U	370 U
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000						390 U	370 U
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000						390 U	370 U
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA								390 U	370 U
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA								390 U	370 U
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA								390 U	370 U
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA								390 U	370 U
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA								390 U	370 U
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA								390 U	370 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA								390 U	370 U
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA								390 U	370 U
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230						390 U	370 U
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA								390 U	370 U
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000						390 U	370 U
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA								390 U	370 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						390 U	370 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						390 U	370 U
VOCs																		
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000						390 U	320 U
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000						390 U	320 U
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200						200 U	160 U
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800						200 U	160 U
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340						49 U	40 U
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990						49 U	40 U
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
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000						99 U	80 U
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890							
BTEX Field Screening																		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990		1.5 U					
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000		1 U					

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: 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
TPH = Total petroleum hydrocarbons
-- = 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 screening levels

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).
- T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
- 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

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.

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location																		
Sample ID	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-DP-02	GI15-DP-03	GI15-DP-03	GI15-DP-04	GI15-DP-04	GI15-DP-05	GI15-DP-05
												GI15-DP-02	GI15-DP-03-0	GI15-DP-03	GI15-DP-04-0	GI15-DP-04	GI15-DP-05-0	GI15-DP-05
Sample Date												06/19/03	06/18/03	06/18/03	06/18/03	06/18/03	06/19/03	06/19/03
Top Depth												5	0	2	0	3	0	1
Bottom Depth												8	2	3	3	3.5	1	1.75
TPH																		
Total Petroleum Hydrocarbons																		
Metals																		
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA			8600	3300	3900	5000	4300	6300	2400
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA			81000	260000	100000	61000	100000	190000	180000
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA			330 B	360 B	500 U	210 B	170 B	860	520 B
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			14000	29000	**380000**	16000	13000	14000	9300
Chromium VI																		
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			13000	67000	13000	27000	12000	33000	4500
Mercury	500	1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA			29	12 B	30	33	28	72	22 U
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA			700 B	2300 U	600 B	500 B	800 B	**1900** B	**1700** B
Silver	1,000	27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA			1200 U	1100 U	990 U	1200 U	1200 U	1600 U	1200 U
Pesticides																		
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA									
SVOCs																		
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000	400 U	390 U	370 U	410 U	420 U	540 U	410 U
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000	400 U	390 U	370 U	410 U	420 U	540 U	410 U
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000	400 U	390 U	370 U	410 U	420 U	540 U	410 U
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			400 U	100 J	370 U	410 U	100 J	540 U	410 U
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA			400 U	130 J	370 U	410 U	90 J	540 U	410 U
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA			400 U	140 J	370 U	410 U	420 U	540 U	410 U
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA			400 U	390 U	370 U	410 U	420 U	540 U	410 U
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA			400 U	140 J	370 U	410 U	420 U	540 U	410 U
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA			400 U	390 U	370 U	410 U	420 U	540 U	410 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA			400 U	130 J	370 U	82 J	110 J	98 J	410 U
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA			400 U	390 U	370 U	410 U	420 U	540 U	410 U
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230	400 U	390 U	370 U	410 U	420 U	540 U	410 U
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA			400 U	210 J	370 U	120 J	220 J	170 J	410 U
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000	400 U	390 U	370 U	410 U	420 U	540 U	410 U
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			400 U	390 U	370 U	410 U	420 U	540 U	410 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	400 U	88 J	370 U	410 U	110 J	540 U	410 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	400 U	390 U	370 U	410 U	420 U	540 U	410 U
VOCs																		
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000	370 U	400 U	430 U	470 U	430 U	730 U	490 U
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000	370 U	400 U	430 U	470 U	430 U	730 U	490 U
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200	190 U	200 U	210 U	240 U	210 U	360 U	250 U
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800	190 U	200 U	210 U	240 U	210 U	360 U	250 U
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340	47 U	50 U	54 U	59 U	53 U	91 U	62 U
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990	47 U	50 U	54 U	59 U	53 U	91 U	62 U
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	190 U	200 U	210 U	240 U	210 U	360 U	250 U
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000	93 U	100 U	110 U	120 U	110 U	180 U	120 U
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890							
BTEX Field Screening																		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990							
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000							

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: Michigan Background Soil Survey (2015) by the Michigan Department of Natural Resources.
BTEX = Benzene, toluene, ethylbenzene, xylenes
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TPH = Total petroleum hydrocarbons
-- = 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 screening levels

Criteria abbreviations:
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- 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

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.

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-DP-06	GI15-DP-06	GI15-DP-06	GI15-DP-07	GI15-DP-07	GI15-DP-07	GI15-DP-08
Sample ID												GI15-DP-06-0	GI15-DP-06-4	GI15-DP-06	GI15-DP-07-0	GI15-DP-07-3	GI15-DP-07	GI15-DP-08-0
Sample Date												06/24/03	06/24/03	06/24/03	06/20/03	06/20/03	06/20/03	06/20/03
Top Depth												0	4	8	0	3	6	0
Bottom Depth												3	6.5	10	3	3.6	7	3
TPH																		
Total Petroleum Hydrocarbons																		
Metals																		
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA			4800	6100	5400	5900	11000	6200	6200
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA			17000	69000	110000	73000	76000	65000	82000
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA			300 B	170 B	130 B	230 B	180 B	90 B	180 B
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			6900	18000	11000	20000	19000	16000	17000
Chromium VI																		
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			5800 H	11000	10000	18000	12000	9400	12000
Mercury	500	1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA			7.9 B	27	27	57	16 B	15 B	22
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA			2000 U	2300 U	500 B	2500 U	2100 U	2100 U	2200 U
Silver	1,000	27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA			980 U	1200 U	1100 U	1200 U	1100 U	1100 U	1100 U
Pesticides																		
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA									
SVOCs																		
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000	330 U	400 U	410 U	410 U	380 U	360 U	380 U
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000	330 U	400 U	410 U	410 U	380 U	360 U	380 U
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000	330 U	400 U	410 U	410 U	380 U	360 U	380 U
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			330 U	400 U	410 U	150 J	380 U	360 U	380 U
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA			330 U	400 U	410 U	120 J	380 U	360 U	380 U
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA			330 U	400 U	410 U	410 U	380 U	360 U	380 U
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA			330 U	400 U	410 U	410 U	380 U	360 U	380 U
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA			330 U	400 U	410 U	410 U	380 U	360 U	380 U
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA			330 U	400 U	410 U	410 U	380 U	360 U	380 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA			330 U	400 U	410 U	130 J	380 U	360 U	380 U
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA			330 U	400 U	410 U	410 U	380 U	360 U	380 U
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230	330 U	400 U	410 U	410 U	380 U	360 U	380 U
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA			330 U	400 U	410 U	380 J	380 U	360 U	380 U
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000	330 U	400 U	410 U	410 U	380 U	360 U	380 U
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			330 U	400 U	410 U	410 U	380 U	360 U	380 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	330 U	400 U	410 U	290 J	380 U	360 U	380 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	330 U	400 U	410 U	290 J	380 U	360 U	380 U
VOCs																		
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000	370 U	340 U	460 U	400 U	350 U	350 U	330 U
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000	370 U	340 U	460 U	400 U	350 U	350 U	330 U
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200	190 U	170 U	230 U	200 U	170 U	170 U	170 U
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800	190 U	170 U	230 U	200 U	170 U	170 U	170 U
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340	47 U	42 U	57 U	50 U	44 U	43 U	42 U
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990	47 U	42 U	57 U	50 U	44 U	43 U	42 U
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	190 U	170 U	230 U	200 U	170 U	170 U	**180**
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000	93 U	84 U	110 U	100 U	87 U	86 U	83 U
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890							
BTEX Field Screening																		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990							
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000							

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: 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
TPH = Total petroleum hydrocarbons
-- = 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).
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
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
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.

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 screening levels

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-DP-08	GI15-DP-08	GI15-DP-09	GI15-DP-09	GI15-DP-09	GI15-DP-10	GI15-DP-10
Sample ID												GI15-DP-08-3	GI15-DP-08	GI15-DP-09-0	GI15-DP-09-3	GI15-DP-09	GI15-DP-10-0	GI15-DP-10-3
Sample Date												06/20/03	06/20/03	06/20/03	06/20/03	06/20/03	06/20/03	06/20/03
Top Depth												3	7	0	3	7	0	3
Bottom Depth												3.7	8.5	3	3.5	7.5	3	3.5
TPH																		
Total Petroleum Hydrocarbons																		
Metals																		
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA			5300	4900	5500	6600	6400	6800	4200
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA			61000	88000	62000	65000	71000	49000	85000
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA			110 B	100 B	130 B	160 B	100 B	190 B	130 B
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			17000	15000	15000	15000	19000	21000	17000
Chromium VI																		
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			9900	8600	14000	9500	8500	15000	10000
Mercury	500	1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA			14 B	11 B	24	14 B	19 B	14 B	20
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA			2000 U	2200 U	2100 U	2100 U	2200 U	2200 U	2300 U
Silver	1,000	27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA			1000 U	1100 U	1100 U	1000 U	1100 U	1100 U	1100 U
Pesticides																		
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA									
SVOCs																		
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000	370 U	360 U	370 U	350 U	380 U	380 U	380 U
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000	370 U	360 U	370 U	350 U	380 U	380 U	380 U
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000	370 U	360 U	370 U	350 U	380 U	380 U	380 U
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA			370 U	360 U	71 J	350 U	380 U	65 J	380 U
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230	370 U	360 U	370 U	350 U	380 U	380 U	380 U
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 U
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000	370 U	360 U	370 U	350 U	380 U	380 U	380 U
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			370 U	360 U	370 U	350 U	380 U	380 U	380 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	370 U	360 U	370 U	350 U	380 U	380 U	380 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	370 U	360 U	370 U	350 U	380 U	380 U	380 U
VOCs																		
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000	320 U	380 U	370 U	340 U	320 U	350 U	340 U
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000	100 J	380 U	370 U	340 U	320 U	350 U	340 U
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200	160 U	190 U	180 U	170 U	160 U	180 U	170 U
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800	160 U	190 U	180 U	170 U	160 U	180 U	170 U
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340	40 U	48 U	46 U	43 U	40 U	44 U	42 U
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990	40 U	48 U	46 U	43 U	40 U	44 U	42 U
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**	**200**	180 U	170 U	160 U	180 U	170 U
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000	80 U	95 U	92 U	86 U	81 U	89 U	84 U
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890							
BTEX Field Screening																		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990							
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000							

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: 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
TPH = Total petroleum hydrocarbons
-- = 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).
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
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
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.

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 screening levels

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-DP-10	GI15-MW-01D	GI15-MW-01D	GI15-MW-01D	GI15-MW-02D	GI15-MW-02D	GI15-MW-03D
Sample ID												GI15-DP-10	GI15-MW-01D-0	GI15-MW-01D-4	GI15-MW-01D	GI15-MW-02D-0	GI15-MW-02D	GI15-MW-03D-0
Sample Date												06/20/03	06/19/03	06/19/03	06/19/03	06/23/03	06/23/03	06/19/03
Top Depth												6	0	4	8	0	4	0
Bottom Depth												6.8	2	6	10	1	4.8	3
TPH																		
Total Petroleum Hydrocarbons																		
Metals																		
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA			4100	5600	6900	4600	5000	7500	5800
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA			48000	58000	140000	76000	18000	170000	67000
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA			110 B	420 B	440 B	310 B	510 U	130 B	410 B
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			13000	13000	19000	19000	9200	18000	15000
Chromium VI																		
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			7100	17000	10000	11000	5800	9900	14000
Mercury	500	1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA			15 B	22	5.7 B	18 B	10 B	56	14 B
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA			2100 U	1000 B	900 B	700 B	2000 U	2100 U	600 B
Silver	1,000	100 (27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA			1000 U	1100 U	1100 U	1200 U	1000 U	1100 U	1200 U
Pesticides																		
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA									
SVOCs																		
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000	360 U	400 U	480	140 J	340 U	390 U	60 J
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000	360 U	400 U	260 J	270 J	340 U	390 U	370 U
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000	360 U	400 U	2300	480	340 U	390 U	430
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			360 U	400 U	4700	1900	340 U	390 U	870
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA			360 U	400 U	**4000**	**2300**	340 U	390 U	750
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA			360 U	400 U	4400	2700	340 U	390 U	630
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA			360 U	400 U	2300	1400	340 U	390 U	340 J
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA			360 U	400 U	2100	1600	340 U	390 U	680
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA			360 U	400 U	550	130 J	340 U	390 U	370 U
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA			360 U	400 U	3700	1800	340 U	390 U	770
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA			360 U	400 U	670	400 J	340 U	390 U	370 U
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230	360 U	400 U	**760**	130 J	340 U	390 U	370 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	400 U	**9100**	3400	340 U	390 U	2000
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000	360 U	400 U	1800	400 J	340 U	390 U	120 J
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			360 U	400 U	2200	1300	340 U	390 U	340 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	360 U	400 U	**8300**	1500	340 U	390 U	1300
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	400 U	11000	2600	340 U	390 U	1700
VOCs																		
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000	340 U	400 U	360 U	410 U	330 U	350 U	360 U
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000	340 U	400 U	360 U	410 U	330 U	350 U	830
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200	170 U	200 U	180 U	210 U	160 U	180 U	180 U
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800	170 U	200 U	180 U	210 U	160 U	180 U	180 U
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340	42 U	50 U	44 U	51 U	41 U	44 U	45 U
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990	42 U	50 U	44 U	51 U	41 U	44 U	45 U
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	170 U	200 U	180 U	210 U	160 U	180 U	180 U
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000	84 U	100 U	89 U	100 U	81 U	88 U	90 U
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890							
BTEX Field Screening																		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990							
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000							

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: 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
TPH = Total petroleum hydrocarbons
-- = 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).
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
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
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.

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 screening levels

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-MW-03D	GI15-MW-03D	GI15-MW-03D	GI15-SB01	GI15-SB01	GI15-DP-02	GI15-DP-03
Sample ID												GI15-MW-03D-4	GI15-MW-03D	GI15-MW-03D	GI15-SB01	GI15-SB01DUP	GI15-DP-02	GI15-DP-03-0
Sample Date												06/19/03	06/19/03	06/20/03	07/17/03	07/17/03	02/18/04	02/18/04
Top Depth												4	15	6	0.5	0.5	0	0
Bottom Depth												5	16	7	1	1	2	2
TPH																		
Total Petroleum Hydrocarbons																		
Metals																		
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA			10000	3500	6100	9300	8300		
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA			81000	210000	100000	79000	66000		
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA			450 B	710	890	250 B	110 B		
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA			19000	9400	**2100000**	12000	12000		
Chromium VI																	2500 U	2200 U
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA			7800	8300	34000	16000	13000		
Mercury	500	1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA			11 B	19 U	14 B	38	45		
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA			800 B	900 B	2300 U	2100 U	500 B		
Silver	1,000	27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA			1100 U	1000 U	**1700**	1100 U	1000 U		
Pesticides																		
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA									
SVOCs																		
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000	360 U	360 U	380 U	380 U	370 U		
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000	360 U	360 U	380 U	380 U	370 U		
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000	360 U	360 U	380 U	380 U	370 U		
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			360 U	360 U	380 U	380 U	370 U		
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA			360 U	360 U	380 U	380 U	370 U		
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA			360 U	360 U	380 U	380 U	370 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	380 U	380 U	370 U		
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA			360 U	360 U	380 U	380 U	370 U		
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA			360 U	360 U	380 U	380 U	370 U		
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA			52 J	48 J	68 J	380 U	370 U		
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA			360 U	360 U	380 U	380 U	370 U		
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230	360 U	360 U	380 U	380 U	370 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	380 U	380 U	370 U		
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000	360 U	360 U	380 U	380 U	370 U		
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA			360 U	360 U	380 U	380 U	370 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	380 U	380 U	370 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	380 U	380 U	370 U		
VOCs																		
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000	360 U	340 U	350 U	390 U	520 U		
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000	360 U	340 U	350 U	390 U	520 U		
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200	180 U	170 U	180 U	200 U	260 U		
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800	180 U	170 U	180 U	200 U	260 U		
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340	45 U	42 U	44 U	49 U	65 U		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990	45 U	42 U	44 U	49 U	65 U		
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	180 U	170 U	180 U	200 U	260 U		
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000	89 U	84 U	88 U	99 U	130 U		
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890							
BTEX Field Screening																		
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990							
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000							

Notes:
Table 1 contains every chemical detected. However, not every chemical is detected in every sample.
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TPH = Total petroleum hydrocarbons
-- = not analyzed/reported
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NLV = Not likely to volatilize under most conditions.
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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).
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
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
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.

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 screening levels

Table 1
Chemicals Detected in Soil
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Regional Background	Groundwater Surface Water Interface Protection Criteria	Residential Infinite Source Volatile Soil Inhalation Criteria	Nonresidential Infinite Source Volatile Soil Inhalation Criteria	Residential Particulate Soil Inhalation Criteria	Nonresidential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	Soil Saturation Concentration Screening Level	Residential Soil Vapor Intrusion Screening Level	Non-Residential Soil Vapor Intrusion Screening	GI15-DP-03	GI15-DP-07	GI15-DP-09
Sample ID												GI15-DP-03	GI15-DP-07	GI15-DP-09
Sample Date												02/18/04	02/18/04	02/18/04
Top Depth												2	0	0
Bottom Depth												4	2	2.9
TPH														
Total Petroleum Hydrocarbons														
Metals														
Arsenic	22800	4,600	NLV	NLV	7.20E+05	9.10E+05	7,600	37,000	NA					
Barium	172000	1,300,000 (G)	NLV	NLV	3.30E+08	1.50E+08	3.70E+07	1.30E+08	NA					
Cadmium	2000	6,000 (G,X)	NLV	NLV	1.70E+06	2.20E+06	5.50E+05	2.10E+06	NA					
Chromium	55600	3,300	NLV	NLV	2.60E+05	2.40E+05	2.50E+06	9.20E+06	NA					
Chromium VI												2500 U	2600 U	2300 U
Lead	26200	700,000 (G,X)	NLV	NLV	1.00E+08	4.40E+07	4.00E+05	9.0E+5 (DD)	NA					
Mercury	500	50 (M); 1.2	52,000	62,000	2.00E+07	8.80E+06	1.60E+05	5.80E+05	NA					
Selenium	1200	400	NLV	NLV	1.30E+08	5.90E+07	2.60E+06	9.60E+06	NA					
Silver	1,000	100 (M); 27	NLV	NLV	6.70E+06	2.90E+06	2.50E+06	9.00E+06	NA					
Pesticides														
4,4'-DDD	NA	NLL	NLV	NLV	4.40E+07	5.60E+07	95,000	4.00E+05	NA					
SVOCs														
Acenaphthene	NA	8,700	8.10E+07	9.70E+07	1.40E+10	6.20E+09	4.10E+07	1.30E+08	NA	432,000	7,260,000			
Acenaphthylene	NA	ID	2.20E+06	2.70E+06	2.30E+09	1.00E+09	1.60E+06	5.20E+06	NA	168,000	2,820,000			
Anthracene	NA	ID	1.40E+09	1.60E+09	6.70E+10	2.90E+10	2.30E+08	7.30E+08	NA	35,600,000	598,000,000			
Benzo(a)anthracene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA					
Benzo(a)pyrene	NA	NLL	NLV	NLV	1.50E+06	1.90E+06	2,000	8,000	NA					
Benzo(b)fluoranthene	NA	NLL	ID	ID	ID	ID	20,000	80,000	NA					
Benzo(ghi)perylene	NA	NLL	NLV	NLV	8.00E+08	3.50E+08	2.50E+06	7.00E+06	NA					
Benzo(k)fluoranthene	NA	NLL	NLV	NLV	ID	ID	2.00E+05	8.00E+05	NA					
Carbazole	NA	1,100	NLV	NLV	6.20E+07	7.80E+07	5.30E+05	2.40E+06	NA					
Chrysene	NA	NLL	ID	ID	ID	ID	2.00E+06	8.00E+06	NA					
Dibenz(a,h)anthracene	NA	NLL	NLV	NLV	ID	ID	2,000	8,000	NA					
Dibenzofuran	NA	1,700	1.30E+05	1.60E+05	6.70E+06	2.90E+06	ID	ID	NA	371	6,230			
Fluoranthene	NA	5,500	7.40E+08	8.90E+08	9.30E+09	4.10E+09	4.60E+07	1.30E+08	NA					
Fluorene	NA	5,300	1.30E+08	1.50E+08	9.30E+09	4.10E+09	2.70E+07	8.70E+07	NA	709,000	11,900,000			
Indeno(1,2,3-cd)pyrene	NA	NLL	NLV	NLV	ID	ID	20,000	80,000	NA					
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			
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			
VOCs														
2-Butanone	NA	44,000	2.90E+07	3.50E+07	6.70E+10	2.90E+10	1.2E+8 (C, DD)	7.0E+8 (C,DD)	2.70E+07	181,000	3,040,000			
Acetone	NA	34,000	1.30E+08	1.60E+08	3.90E+11	1.70E+11	2.30E+07	7.30E+07	1.10E+08	311,000	5,230,000			
Bromomethane	NA	100	11,000	13,000	3.30E+08	1.50E+08	3.20E+05	1.00E+06	2.20E+06	200	200			
Carbon disulfide	NA	ID	1.30E+06	1.60E+06	4.70E+10	2.10E+10	7.2E+6 (C, DD)	4.3E+7 (C,DD)	2.80E+05	250	3,800			
Chloroform	NA	7,000	45,000	1.50E+05	1.30E+09	1.60E+09	1.20E+06	5.5E+6 (C)	1.50E+06	50	340			
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990			
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			
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000			
Xylenes, Total	NA	980	4.60E+07	5.40E+07	2.90E+11	1.30E+11	4.1E+8 (C)	1.0E+9 (C,D)	1.50E+05	291	4,890			
BTEX Field Screening														
Ethylbenzene	NA	360	7.20E+05	2.40E+06	1.00E+10	1.30E+10	2.2E+7 (C)	7.1E+7 (C)	1.40E+05	198	3,990			
Toluene	NA	5,400	2.80E+06	3.30E+06	2.70E+10	1.20E+10	5.0E+7 (C)	1.6E+8 (C)	2.50E+05	10,100	169,000			

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Depths provided in feet below ground surface
Shaded/bolded values exceed one or more screening levels

Table 2
Chemicals Detected in Groundwater
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Groundwater Surface Water Interface	Solubility	Flammability and Explosivity	Residential Groundwater Vapor	Nonresidential Groundwater Vapor Intrusion	Residential Shallow Groundwater	Nonresidential Shallow Groundwater	U.S. EPA Vapor Intrusion Screening Level -	GIS-MW04	GI15-001GW	GI15-003GW	GI15-002GW	GI15-002GW	GI15-002GW	GI15-PZ-01	GI15-PZ-02	GI15-PZ-03	GI15-MW-03D	GI15-MW-01D	GI15-MW-02D
Sample ID									GIS-MW04	GI15-001GW	GI15-003GW	GI15-002GW	GI15-002GW	GI15-002GW	GI15-PZ-01	GI15-PZ-02	GI15-PZ-03	GI15-MW-03D	GI15-MW-01D	GI15-MW-02D
Sample Date									06/07/90	04/02/96	04/02/96	04/05/96	08/20/96	08/20/96	07/08/03	07/09/03	07/09/03	07/10/03	07/11/03	07/11/03
Dissolved Metals																				
Chromium, Dissolved	11	NA	ID										5 U	5 U						
Lead, Dissolved	14 (G,X)	NA	ID										1 U	1 U						
Total Metals																				
Barium	670 (G)	NA	ID						62						60	65	130	610	600	260
Chromium	11	NA	ID						2 U				**70**	**19.4** B	10 U	10 U	10 U	10 U	10 U	10 U
Lead	14 (G,X)	NA	ID						2 U				**53.9**	10.9	5.4 B	3.4 B	3.4 B	10 B, U	10 U	3.9 B
Manganese	1,300 (G,X)	NA	ID						99											
Mercury	0.0013	56	ID						0.2 U						0.2 U	0.2 U	**0.07** B	0.2 U	0.2 U	0.2 U
Sodium									6000											
TPH																				
Total Petroleum Hydrocarbons									1500 U											
VOCs																				
Carbazole	4.0	7480	ID									5 U			4.8 J	3.8 J	10 U	10 U	10 U	9.7 U
Acetone	1,700	1,000,000,000	15,000,000	8,200,000	34,000,000	8,200	34,000	23,000,000	10 U			5 U			10 U	10 U	10 U	26	8.5 J	10 U
Benzene	200 (X)	1,750,000	68,000	27	140	5	5	16	5 U	1.5		1 U			1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	ID	1,190,000	13,000	2,400	9,900	5	9.9		5 U			1 U			2 U	2 U	2 U	2 U	2 U	2.3
Chloroform	350	7,920,000	ID	140	720	80	80	8.1	5 U			1 U			1 U	1 U	1 U	0.9 J	1 U	1 U
Ethylbenzene	18	169,000	43,000	700	2,600	700	700	35	5 U			1 U			1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	1,500 (X)	17,000,000	ID	820	4,200	5	5	4,700	2 J			1 U			2 U	2 U	2 U	2 U	2 U	2 U
Toluene	270	526,000	61,000	36,000	150,000	1,000	1,000	19,000	5 U			1			1 U	1 U	1 U	1 U	0.77 J	1 U
Xylenes (m&p)															2 U	2 U	2 U	2 U	2 U	2 U
Xylenes, Total	49	186,000	70,000	10,000	10,000	10,000	10,000		5 U			1 U								
BTEX Field Screening																				
Ethylbenzene	18	169,000	43,000	700	2,600	700	700	35		1.4	1 U									
Toluene	270	526,000	61,000	36,000	150,000	1,000	1,000	19,000		4.1	1.4									
Xylenes (m&p)										3	1.2									
Xylenes, Total	49	186,000	70,000	10,000	10,000	10,000	10,000			3	1.2									

Notes:
Table 2 contains every chemical detected. However, not every chemical is detected in every sample.
The footnote will be modified to reflect the following: 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
TPH = Total petroleum hydrocarbons
All concentrations given in micrograms per liter (µg/L).
Criteria included for relevant pathways.
Shaded/bolded values exceed one or more of the criteria shown in this table
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).
T = Any releases at this site would be considered pre-1978 and federal Toxic Substances Control Act rules do not apply unless detected
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
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.

Table 3
Chemicals Detected in Sediment
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Regional Background	Residential Direct Contact Criteria	Nonresidential Direct Contact Criteria	PECs (MacDonald et al., 2000)	GI15-SED-02	GI15-SED-03	GI15-SED-04	GI15-SED-05	GI15-SED-06	GI15-SED-07
Sample Date					11/03/04	11/03/04	11/03/04	11/03/04	11/03/04	11/03/04
Total Metals										
Arsenic	22,800	7,600	37,000	33,000	7500	8200	6700	6900	7700	7800
Barium	172,000	37,000,000	130,000,000		160000	240000	230000	230000	200000	250000
Cadmium	2,000	550,000	2,100,000	4,980	900 B	680 B	1400 B	1400	1000 B	920 B
Chromium	55,600	2,500,000	9,200,000	111,000	14000	20000	20000	17000	18000	20000
Copper	46,900	20,000,000	73,000,000	149,000	20000	20000	27000	23000	26000	27000
Lead	26,200	400,000	9.0E+5 (DD)	128,000	38000	86000	56000	53000	46000	51000
Mercury	500	160,000	580,000	1,060	46 B	55 B	57 B	79 B	64 B	51 B
Selenium	1,200	2,600,000	9,600,000		12000 U	13000 U	3000 B	2200 B	12000 U	3000 B
Zinc	108,000	170,000,000	630,000,000	459,000	110000	120000	150000	140000	130000	140000
SVOCs										
Benzo(a)anthracene		20,000	80,000	1,050	780 U	870 U	64 J	670 U	840 U	820 U
Benzo(a)pyrene		2,000	8,000	1,450	780 U	870 U	95 J	670 U	250 J	240 J
Benzo(b)fluoranthene		20,000	80,000		780 U	250 J	120 J	210 J	310 J	250 J
Benzo(ghi)perylene		2,500,000	7,000,000		780 U	870 U	73 J	670 U	840 U	820 U
Benzo(k)fluoranthene		200,000	800,000		780 U	870 U	72 J	670 U	840 U	820 U
Chrysene		2,000,000	8,000,000	1,290	780 U	870 U	94 J	670 U	840 U	820 U
Fluoranthene		46,000,000	130,000,000	2,230	280 J	870 U	210	330 J	520 J	300 J
Phenanthrene		1,600,000	5,200,000		1600 U	1800 U	430 U	1400 U	1700 U	1700 U
Pyrene		29,000,000	84,000,000	1,520	1600 U	1800 U	130 J	1400 U	310 J	1700 U
Total PAHs				22,800	8160	9070	1288	6690	6450	7470
VOCs										
					Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
PCBs										
					Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Notes:
Table 3 contains every chemical detected. However, not every chemical is detected in every sample.
All concentrations given in micrograms per kilogram (µg/kg).
Criteria included for relevant pathways.
Shaded/bolded values exceed one or more of the Generic Cleanup Numbers shown in this table or background (if background is more than the Generic)
VOCs = Volatile organic compounds
PECs = Probable Effects Concentrations
PCBs = Polychlorinated biphenyls
SVOCs = Semi-volatile organic compounds
Total PAHs = Total polycyclic aromatic hydrocarbons, calculated using full detection limits.
-- = not analyzed/reported

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.

Criteria abbreviations:

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.

Table 4
Chemicals Detected in Surface Water
AOC 15 - Former Nike Missile Magazines
Former NASGI, Grosse Ile, MI

Location	Human Non-Cancer Value (Drink)	Human Cancer Value (Drink)	Aquatic Life FCV	GIS-SW01	GI15-SW01-10	GI15-SW01-2	GI15-SW01-6
Sample Date				05/22/90	11/04/04	11/04/04	11/04/04
TPH							
Total Petroleum Hydrocarbons				1,400 U			
PCBs							
					Not Detected	Not Detected	Not Detected
Metals							
Barium	5,800	NA	440	130	110	120	110
Chromium	120	NA	86	2 U	0.85 B	1.4 B	1.1 B
Lead	14	NA	31	2.2	3 U	3 U	3 U
SVOCs							
Di-n-butylphthalate	640	NA	9.7		0.42 J	5 U	5 U
VOCs							
Methylene chloride	1,600	47	1,500	5 B	2 U	2 U	2 U

Table 4 contains every chemical detected. However, not every chemical is detected in every sample.
All concentrations given in micrograms per liter (µg/L).
Criteria included for relevant pathways.
Shaded/bolded values exceed one or more of the cleanup criteria presented in this table.

FCV = Final chronic value for total fraction
NA = Not Applicable
VOCs = Volatile organic compounds
PCBs = Polychlorinated biphenyls
SVOCs = Semi-volatile organic compound
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.

Source: Rule 57 Surface Water Quality Values, February 1, 2020.