US EPA RECORDS CENTER REGION 5
487113

SITE INVESTIGATION REPORT
for
Atwater Facility

United States Coast Guard
Detroit, Michigan

Department of Homeland Security
United States Coast Guard
Civil Engineering Unit Cleveland

Task Order Number - HSCG83-09-J-3CL358
Contract Number - HSCG83-08-D-3CL109

November 2012

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF: SR-6J

December 20, 2012

Gregory O. Carpenter
Chief, Environmental Compliance
United States Coast Guard
Civil Engineering Unit
1240 East Ninth Street, Room 2179
Cleveland, OH 44199-2060

Re: Final Site Investigation Report
U.S. Coast Guard Atwater Facility
Detroit, Michigan
Tetra Tech, Inc., November 2012
Transmitted by your December 5, 2012 letter.

Dear Mr. Carpenter:

U.S. EPA has completed its review of the Final Site Investigation Report for the Detroit Atwater Property and the responses to our November 5, 2012 comment letter on the Draft Report. All of our technical comments were adequately addressed.

U.S. EPA concurs with the Coast Guard's conclusion that no further action is necessary under CERCLA, under the exposure scenario presented by the City of Detroit's current site reuse plan to extend River Walk through the site (Section 1.1). However, new residential-reuse restrictions will need to be recorded by the Coast Guard prior to property divestiture. It is our understanding that regulatory groundwater restrictions are already in place within the City of Detroit.

Data presented to this office by the Coast Guard indicates that the cleanup has achieved federal and MDEQ non-residential cleanup criteria for the constituents of concern, and the cleanup process is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). By meeting these criteria, the cleanup is protective of human health and the environment under CERCLA.

In order to avoid the administrative inconvenience and expense of maintaining the restrictive covenants in the future, the Coast Guard may wish to consider removing enough contaminated soil to provide for an unrestricted reuse of the site. It is our understanding that the Coast Guard will be preparing and Engineering Evaluation/Cost Analysis to consider this, along with other treatment alternatives.

If you have any questions I can be reached at 312 886-4843.

Sincerely,

W. Owen Thompson
Remedial Project Manager
Superfund Remedial Response Section Seven

cc: Stephen Ostrodka, Chief, RRS#7
James A. Cook, USCG

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
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U.S. EPA concurs with the Coast Guard's conclusion that no further action is necessary under CERCLA, under the exposure scenario presented by the City of Detroit's current site reuse plan to extend River Walk through the site (Section 1.1). However, new residential-reuse restrictions will need to be recorded by the Coast Guard prior to property divestiture. It is our understanding that regulatory groundwater restrictions are already in place within the City of Detroit.

Data presented to this office by the Coast Guard indicates that the cleanup has achieved federal and MDEQ non-residential cleanup criteria for the constituents of concern, and the cleanup process is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). By meeting these criteria, the cleanup is protective of human health and the environment under CERCLA.

In order to avoid the administrative inconvenience and expense of maintaining the restrictive covenants in the future, the Coast Guard may wish to consider removing enough contaminated soil to provide for an unrestricted reuse of the site. It is our understanding that the Coast Guard will be preparing and Engineering Evaluation/Cost Analysis to consider this, along with other treatment alternatives.

If you have any questions I can be reached at 312 886-4843.

Sincerely,

W. Owen Thompson
Remedial Project Manager
Superfund Remedial Response Section Seven

cc: Stephen Ostrodka, Chief, RRS#7
James A. Cook, USCG

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: December 20, 2012

FROM: Michael Chrystof

TO: Owen Thompson, Remedial Project Manager

SUBJECT: US-EPA Comments on Site Investigation Report (November 2012), for USCG Atwater Detroit site, Detroit, MI.

Attachment:

US-EPA COMMENT ON SITE INVESTIGATION REPORT,
USCG ATWATER DETROIT

COMMENT:

1. Review has been completed on the November, 2012 Site Investigation Report, and Data Validation has been found satisfactory with no significant problems noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF: SR-6J

December 18, 2012

George O. Carpenter
Chief, Environmental Compliance
United States Coast Guard
Civil Engineering Unit
1240 East Ninth Street, Room 2179
Cleveland, OH 44199-2060

Re: Final Site Investigation Report
U.S. Coast Guard Atwater Facility
Detroit, Michigan
Tetra Tech, Inc., November 2012
Transmitted by your December 5, 2012 letter.

Dear Mr. Carpenter:

U.S. EPA has completed its review of the Final Site Investigation Report for the Detroit Atwater Property and the responses to our November 5, 2012 comment letter on the Draft Report.

U.S. EPA concurs with the Coast Guard's conclusion that no further action is necessary under CERCLA so long as residential reuse is prohibited, and groundwater use is restricted. This type of recreational reuse is consistent with the current plans to extend the City of Detroit's riverfront park and bike path through the site.

Data presented to this office by the Coast Guard indicates that the cleanup has achieved federal and MDEQ cleanup criteria for the constituents of concern, and the cleanup process is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). By meeting these criteria, the cleanup is protective of human health and the environment under CERCLA.

If you have any questions I can be reached at 312 886-4843.

Sincerely,

W. Owen Thompson
Remedial Project Manager
Superfund Remedial Response Section Seven

cc: Stephen Ostrodka, Chief, RRS#7
James A. Cook, USCG

RESPONSE TO USEPA COMMENTS (from Keith Fusinski, PhD Toxicologist), DATED NOVEMBER 1, 2012
DRAFT SITE INVESTIGATION REPORT
USCG ATWATER FACILITY, DETROIT, MI
TTNUS CONTRACT HSCG-83-08-D-3CL109
TASK ORDER HSCG-83-09-J-3CL358
P/N 21-09-8393CL358
NOVEMBER 2012

Comments by USEPA were provided in an email (06 November 2012) from the USEPA to USCG. The following are the responses to the comments.

1. **Page E-5 Human Health Risk Assessment. Vapor Intrusion COPC Selection for Groundwater and Table E-9.** The investigation report states the vapor intrusion screening levels are based upon the 2002 Draft Guidance for Evaluating the Vapor Intrusion Indoor Air Pathway from Groundwater and Soils. The screening levels proposed is this guidance were considered invalid by the Office of Inspector General in 2009 due to some inhalation screening levels being based upon ingestion screening criteria. It is suggested that the current EPA Vapor Intrusion Screening Level (VISL) calculator be used to determine inhalation screening levels from groundwater. The VISL calculator is a downloadable spreadsheet which updated throughout the year based upon changes to the EPA Regional Screening levels. The downloadable VISL calculator can be found at http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6. As a note, use of the VISL calculator will not change any screening levels which were used in the Risk Assessment, however, it is more appropriate to use than the 2002 Draft Guidance.

Response: Agree. The text and Tables E-5 and E-9 will be updated to indicate that the VISL calculator was used. Agree that there are no changes to screening levels used in the risk assessment on this basis.

2. **Table E-13.** The PEF used for construction workers should be the same as all other receptors since it is based upon geographical location and not receptor.

Response: As stated in Section 3.4, Inhalation of Air Containing Fugitive Dust/Volatiles Emitted from Soil, a separate PEF was calculated for construction workers because it is anticipated that fugitive dust emissions settings would be different than dust emissions generated during construction activities. The PEF for construction workers is more conservative than the PEF used for other receptors. However, because risks and hazard indices calculated for construction workers did not exceed benchmark levels, the use of a separate, more conservative PEF for construction workers does not affect overall risk assessment conclusions. No changes to the risk assessment are necessary.

3. **Page 5-1. Section 5.0 Conclusions.** The conclusions made in this section are deemed protective of human health.

Response: Comment acknowledged.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF: SR-6J

November 6, 2012

Gregory O. Carpenter
Chief, Environmental Compliance
United States Coast Guard
Civil Engineering Unit
1240 East Ninth Street, Room 2179
Cleveland, OH 44199-2060

Re: Draft Site Investigation Report
U.S. Coast Guard Atwater Facility
Detroit, Michigan
Tetra Tech, Inc., October 2012
Transmitted by your October 17, 2012 letter.

Dear Mr. Carpenter:

U.S. EPA has completed its review of the Draft Site Investigation the Detroit Atwater site. Except as noted in the enclosed comments on the Human Health Risk Assessment, we find the report to be technically acceptable and recommend that it be finalized.

If you have any questions I can be reached at 312 886-4843.

Sincerely,

W. Owen Thompson
Remedial Project Manager
Superfund Remedial Response Section Seven

Enclosure

cc: Stephen Ostrodka, RRS#7, U.S. EPA
Mike Chrystof, U.S. EPA
Lynn Keller, USCG

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
9311 GROH ROAD
GROSSE ILE, MI 48138

MEMORANDUM

SUBJECT: Review of the Draft Site Investigation Report for Atwater Facility, United States Coast Guard Detroit, Michigan.

FROM: Keith Fusinski, PhD Toxicologist US EPA
Superfund Division, Remedial Response Branch #1, Remedial Response Section #1

TO: Owen Thompson, Remedial Project Manager, US EPA
Superfund Division, Remedial Response Branch #2, Remedial Response Section 7

DATE: 11/1/2012

Specific Comments;

Page E-5 Human Health Risk Assessment. Vapor Intrusion COPC Selection for Groundwater and Table E-9. The investigation report states the vapor intrusion screening levels are based upon the 2002 Draft Guidance for Evaluating the Vapor Intrusion Indoor Air Pathway from Groundwater and Soils. The screening levels proposed is this guidance were considered invalid by the Office of Inspector General in 2009 due to some inhalation screening levels being based upon ingestion screening criteria. It is suggested that the current EPA Vapor Intrusion Screening Level (VISL) calculator be used to determine inhalation screening levels from groundwater. The VISL calculator is a downloadable spreadsheet which updated throughout the year based upon changes to the EPA Regional Screening levels. The downloadable VISL calculator can be found at http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item6. As a note, use of the VISL calculator will not change any screening levels which were used in the Risk Assessment, however, it is more appropriate to use than the 2002 Draft Guidance.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF: SR-6J

November 6, 2012

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United States Coast Guard
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Cleveland, OH 44199-2060

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W. Owen Thompson
Remedial Project Manager
Superfund Remedial Response Section Seven

Enclosure

cc: Stephen Ostrodka, RRS#7, U.S. EPA
Mike Chrystof, U.S. EPA
Lynn Keller, USCG

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SUBJECT: Review of the Draft Site Investigation Report for Atwater Facility, United States Coast Guard Detroit, Michigan.

FROM: Keith Fusinski, PhD Toxicologist US EPA
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TO: Owen Thompson, Remedial Project Manager, US EPA
Superfund Division, Remedial Response Branch #2, Remedial Response Section 7

DATE: 11/1/2012

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U.S. Department of Homeland Security

United States Coast Guard

Commanding Officer
United States Coast Guard
Civil Engineering Unit Cleveland

1240 East Ninth Street
Room 2179
Cleveland Ohio 44199-2060
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11000

OCT 17 2012

United States Environmental Protection Agency
Region 5
Superfund Div, SR-6J
Remedial Response Section 6
Mr. Owen Thompson
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Mr. Thompson:

Please find the attached USCG Detroit Atwater Facility Draft Final Site Investigation Report for your review and comment. The Draft Final EE/CA and Removal Action Work Plan will be submitted for your review and comment within the month as well.

If you have any questions or would like to discuss the site work in detail, please contact Mr. Jim Cook at (216) 902-6255.

Sincerely,

Gregory O. Carpenter
Chief, Environmental Compliance
By direction of the Commanding Officer

Enclosures (1) Draft Final Site Investigation Report (hard copy and CD): USCG Detroit Atwater Facility, Michigan, October 2012

U.S. Department of Homeland Security

United States Coast Guard

Commanding Officer
United States Coast Guard
Civil Engineering Unit Cleveland

1240 East Ninth Street
Room 2179
Cleveland Ohio 44199-2060
Phone: (216) 902-6255
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DEC 05 2012

United States Environmental Protection Agency
Region 5
Superfund Div, SR-6J
Remedial Response Section 6
Mr. Owen Thompson
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Mr. Thompson:

Please find the attached Site Investigation report accompanied by responses to USEPA comments.

If you have any questions or would like to discuss these documents in detail, please contact Mr. James Cook at (216) 902-6255.

Sincerely,

Gregory O. Carpenter
Chief, Environmental Compliance
By direction of the Commanding Officer

Enclosures (1) Site Investigation Report (hard copy and CD): USCG Atwater Facility, Detroit, Michigan, November 2012
(2) Atwater Facility Site Investigation Report : Responses to Comments

081110/P

SITE INVESTIGATION REPORT
FOR
ATWATER FACILITY

UNITED STATES COAST GUARD
DETROIT, MICHIGAN

Department of Homeland Security
United States Coast Guard
Civil Engineering Unit Cleveland
Task Order Number - HSCG83-09-J-3CL358
Contract Number - HSCG83-08-D-3CL109

Submitted by:
Tetra Tech, Inc.
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

NOVEMBER 2012

PREPARED UNDER THE SUPERVISION OF:

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ACRONYMS

AST	above ground storage tank
BaPEq	benzo(a)pyrene equivalents
bgs	below ground surface
COC	chemical of concern
DO	dissolved oxygen
DPT	direct push technology
EE/CA	Engineering Evaluation/Cost Analysis
EM	Enviro Matrix
ESA	Environmental Site Assessment
FSP	Field Sampling Plan
FSPG&S	Field Sampling Plan Groundwater and Soil
HI	hazard index
HHRA	human health risk assessment
IDW	investigation-derived waste
ILCR	incremental lifetime cancer risk
LOD	limit of detection
MCL	maximum contaminant levels
MDEQ	Michigan Department of Environmental Quality
mg/kg	milligram per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NAD	North American Datum
NAVD	North American Vertical Datum
NTU	nephelometric turbidity unit
ORP	oxidation-reduction potential
PAH	polycyclic aromatic hydrocarbon
PID	photoionization detector
PPE	personal protection equipment
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
QAPPA	Quality Assurance Project Plan Addendum
QA	Quality Assurance
QC	Quality Control
RBSL	risk-based screening level
RCRA	Resource Conservation and Recovery Act

REC	recognized environmental condition
SI	Site Investigation
SVOC	semivolatile organic compound
TCLP	Toxicity Characteristic Leaching Procedure
Tetra Tech	Tetra Tech, Inc.
UCL	upper confidence limit
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
µg/kg	microgram per kilogram
µg/L	microgram per liter

1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) was contracted by the United States Coast Guard (USCG) to perform a Site Inspection (SI) and associated reporting for the USCG Atwater Facility (Site) located in Detroit, Michigan. This SI report presents the results of the SI investigation, sampling, and analytical activities. Data is compared to Michigan Department of Environmental Quality (MDEQ) criteria and human health risk assessment (HHRA) is presented.

1.1 CURRENT SITE CONDITIONS

Activity on the USCG Atwater Facility property in Detroit, Michigan began prior to 1897. The property covers approximately 1.26 acres of harborfront land in downtown Detroit. No buildings are currently on the site. The former maintenance building and garage were demolished around 2004. The site is predominantly covered with asphalt and concrete with a small grassy area. A fence with a locked gate is located along Atwater Street and a fence is located on the eastern and western sides of the property to restrict access to the site. The general site location is depicted in Figure 1-1, Site Location Map. A site map of the Detroit Atwater Property is provided as Figure 1-2.

The current and historic site use is industrial. The property will be given to the City of Detroit through a land trade between the USCG and the City. The parcel will be incorporated into the Detroit Waterfront plan and the River Walk will be extended through the property.

1.2 PREVIOUS INVESTIGATIONS

Two previous site investigations were conducted at the Atwater site. The first was a Phase I Environmental Site Assessment (ESA) conducted by Tetra Tech NUS, Inc. in 2001 (Tetra Tech, 2002). This assessment identified four potential areas of concern: possible asbestos - containing building materials, an above ground storage tank (AST), oil and gas storage area, and the filled-in slip area. TtNUS then conducted a Phase II investigation where seven soil samples were collected. Samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and Resource Conservation and Recovery Act (RCRA) metals. Although a few SVOC and metal concentrations exceeded MDEQ Michigan residential soil criteria, results were within an acceptable range for industrial use. Samples were collected in various locations laterally around the property and up to 9 feet below ground surface (bgs). Based on the sample results there were no areas of significant environmental concern requiring remediation based on continued classification of the site as industrial and there were no further recommendations at that time.

In 2006, Enviro Matrix (EM) conducted a Phase I and II of the site for the Economical Development Corporation of the City of Detroit (EM, 2006). The Phase I indicated three potential recognized environmental conditions (RECs) exist at the site. The RECs identified were: Fill of unknown origin may have been brought into the parcel, the property has been used by the USCG and other unknown uses dating back to the late 1800s, and heavy industrial activities in the area. Subsequently, they conducted a Phase II site investigation. Five soil borings were advanced and six soil samples were collected for polycyclic aromatic hydrocarbons (PAHs), metals (Michigan 10), and one location was analyzed for VOCs. This investigation identified elevated PAHs and metals greater than the most restrictive MDEQ criteria. Samples were collected in various locations laterally around the property and up to 10.5 feet bgs.

During the Phase II activities, soil was also logged and reported. At this time, the buildings had been demolished and a few of the samples were collected within the footprint of the former garage and office. Dark brown topsoil was noted from 0.5 foot to 1.5 feet bgs. Below topsoil or paving was fill consisting of silty sand, silty clay, or variegated clay layers to approximately 4.0 feet to 17.5 feet bgs. Discoloration was observed throughout the fill. Below the fill was clayey sand, sandy silty clay, or sandy clay to the depth of the boring (ranging from 15.5 feet to 25.5 feet bgs) (EM, 2006).

Boring logs in both the TtNUS and EM ESA reports note the presence of clay and/or clayey soils throughout the site. In borings advanced during the EM ESA (maximum depth of 22 feet bgs), field conditions did not produce large enough quantities of groundwater to collect adequate samples. Therefore, no groundwater samples were collected. The regional geology in the vicinity of the Detroit River is noted to have significant amount of lacustrine clay. Typically, this clay is very stiff and demonstrates low permeability.

Geologic information at the site was identified during the TtNUS Phase I as being located within the southeastern part of the Michigan Basin. The Michigan Basin received shallow- to deep-water sediments throughout much of the Paleozoic Era (extending from the Ordovician through the Pennsylvanian Periods). Lithologically, the sediments deposited during this time period produced a vast thickness of sandstones, siltstones, shales, limestones and evaporites. Based on generalized geologic mapping of the state (modified from Martin, 1957, Geological Map of Michigan), bedrock underlying the facility consists of the Lower Middle Devonion-age Dundee Limestone that typically ranges in thickness from 40 to 160 feet (TtNUS, 2002).

Geologic conditions at the Detroit Atwater site were characterized as part of the Phase II ESA. The shallow subsurface lithology of the site was characterized to a depth of 9 feet and consists of 4 to 4.5 feet of fill and concrete overlying 4 feet of gravelly to organic clay. Soil obtained beneath the clay layer from 8 to 9 feet below ground surface is characterized as gravelly to silty sand (TtNUS, 2002).

1.3 SITE INVESTIGATION OBJECTIVES

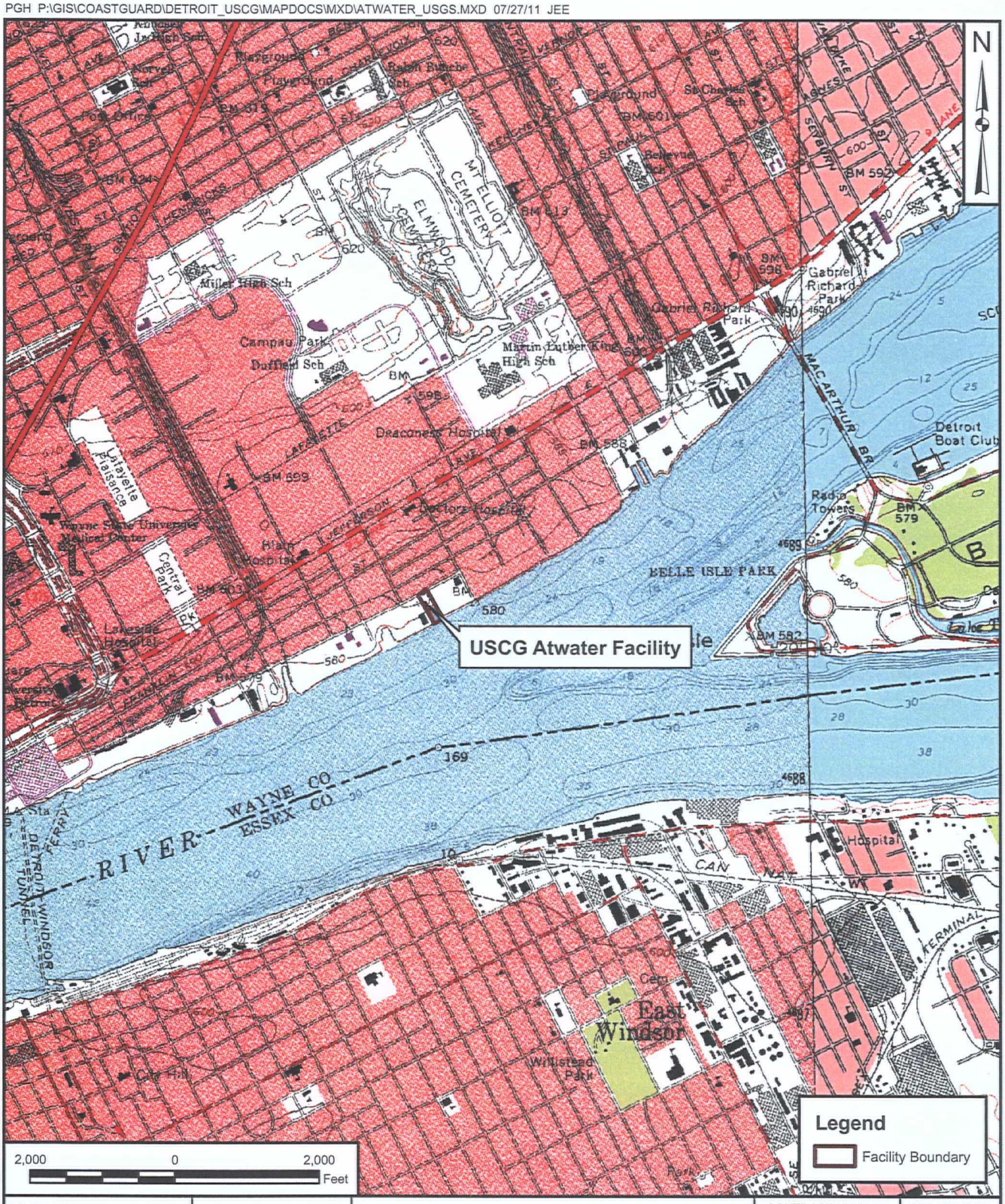
Data collected during the SI will be used to meet the following objectives:

- Determine the nature and extent of contamination within soil and groundwater at the site.
- Prepare an HHRA.
- Prepare a SI Report for submittal to the USCG and United States Environmental Protection Agency (USEPA).

1.4 REPORT ORGANIZATION

The purpose of this SI report is to present the results of the SI activities that TtNUS conducted at Detroit Atwater. Section 1.0 presents the purpose and introduction to the report. Section 2.0 presents the SI acvities performed at Detroit Atwater. Section 3.0 presents the nature and extent of contamination. Section 4.0 compares the results to criteria. Section 5.0 presents the conclusion and recommedations. This report also includes appendices that contain boring logs, well construction diagrams, sample log sheets, photographs, the investigation-derived waste disposal documents, validation reports, laboratory results, survey data, and the HHRA.

PGH P:\GIS\COASTGUARD\DETROIT_USCG\MAPDOCS\MXD\ATWATER_USGS.MXD 07/27/11 JEE



DRAWN BY J. ENGLISH	DATE 07/27/11		SITE LOCATION MAP ATWATER FACILITY DETROIT, MICHIGAN	CONTRACT NUMBER 02435	CTO NUMBER —
CHECKED BY S. HILL	DATE 07/28/11			APPROVED BY —	DATE —
REVISED BY	DATE			APPROVED BY —	DATE —
SCALE AS NOTED				FIGURE NO. FIGURE 1-1	REV 0

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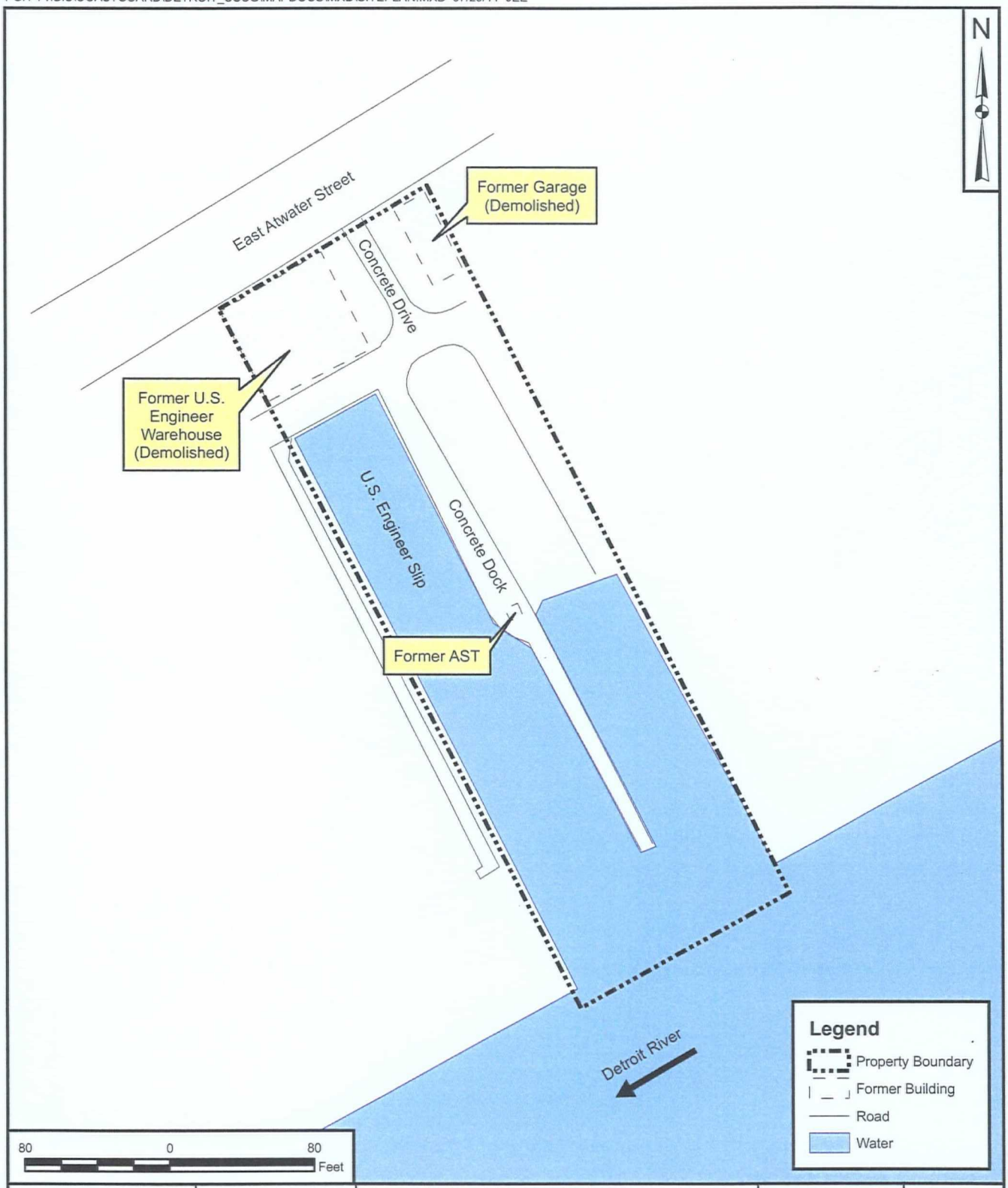

DRAWN BY: J. ENGLISH	DATE: 07/27/11	SITE PLAN ATWATER FACILITY DETROIT, MICHIGAN	CONTRACT NUMBER: 02435
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2.0 SITE INVESTIGATION ACTIVITIES

The following subsections provide a detailed discussion of field activities that were conducted during the course of the SI at USCG Atwater in Detroit, MI.

2.1 GENERAL DESCRIPTION AND INFORMATION

This SI was performed to determine the nature of the surface and subsurface soil at USCG Atwater. The SI was completed in two phases. The first phase was a soil investigation (April 2010). Based on the soil investigation results, USEPA requested a groundwater investigation. The second phase consisted of resampling of soil and the groundwater investigation (May/June 2011). Following the SI activities, three rounds of groundwater samples were collected at quarterly intervals.

The field components of the SI included the advancement of soil borings using direct push technology (DPT), installation of groundwater monitoring wells, and the collection and analysis of groundwater and subsurface soil samples.

2.2 DEVIATIONS FROM THE WORK PLAN

Work was done in accordance to the Field Sampling Plan (FSP) (TtNUS, 2010a) and Field Sampling Plan Groundwater and Soil (FSPG&S) (TtNUS, 2011a) with two minor deviations:

- Soil boring DASB113 could not be advanced as proposed. After several unsuccessful attempts to core through concrete (up to 18 inches encountered, see photograph in Appendix A-13) within the vicinity of the proposed location it was determined that samples could not be obtained.

- Soil boring DASB114 was relocated to obtain a sample outside of the thick concrete at the proposed location.

2.3 SOIL SAMPLING

Fourteen soil borings were advanced as shown on Figure 2-1 on April 20 and 21, 2010 (one boring from the original plan of 15 boring could not be advanced due to thick concrete was encountered). Prior to drilling activities, utilities were identified through MISS Dig One-Call. Additionally, CardnoTBE was contracted to conduct an independent utility clearance on the property. DPT was conducted using a hydraulically-powered direct-push machine for lithologic characterization of soils, collection of surface and subsurface soil samples, and to determine the depth to the water table at the site. Soil samples were collected continuously during borehole advancement. Each boring was logged on soil boring log sheets

as the boring was being drilled. Soil boring logs are presented in Appendix A-2 (2010). For worker safety, air quality was monitored in and near each borehole during drilling operations using a photoionization detector (PID).

Soil samples were screened in the field using a PID immediately after the acetate liner was cut open. The sample interval was placed in a labeled plastic Ziplock® (or equivalent) bag for homogenization of the sample. Care was taken to not include any foreign matter (i.e., vegetation, rocks, debris) in the soil samples collected. In general, the samples were analyzed "as-is." The samples were manipulated within the bags to break up any larger soil fragments to produce a relatively homogenous sample. Soil samples were then placed into clean, laboratory-supplied sample containers, and immediately labeled and packed on ice in an insulated cooler for delivery to the laboratory for analysis. Soil Sample Log Sheets are provided in Appendix A-4.

Table 2-1 is a summary of the surface and subsurface soil samples collected and laboratory analysis conducted. The soil samples collected for laboratory analysis were analyzed for PAHs and metals. The results of the soil sample analysis are presented in Section 3.

Because the temperature of one cooler exceeded the temperature criterion in the QAPP, 16 samples (DASS102-0002, DASB102-0406, DASS104-0204, DASB104-0204, DASS106-0002, DASB106-0204, DASS109-0002, DASB109-0204, DASS110-0002, DASB110-0305, DASS111-0002, DASB111-0305, DASS112-0002, DASB112-0204, DASS115-0002, and DASB115-0204) were resampled for PAHs and mercury in May 2011. The 2011 soil samples were collected using the same procedures described above. The samples are also summarized in Table 2-1, and the sample logsheets are included in Appendix A-5. The results of the original samples that exceeded the temperature criterion were not used in the evaluation in this report.

2.4 MONITORING WELL INSTALLATION AND SAMPLING

In May 2011, four permanent monitoring wells (MW01 through MW04) were installed at the Atwater Site to investigate the first water bearing (shallow groundwater) zone. Monitoring wells were installed to allow for the collection of groundwater samples for laboratory analysis to assess for the presence of groundwater contamination and, to determine the depth to groundwater for estimation of groundwater flow direction.

The following subsections discuss the permanent monitoring well drilling, installation, and construction, and groundwater sample collection.

2.4.1 Monitoring Well Drilling and Installation

TTL Associates, under Tetra Tech's supervision, installed the four monitoring wells (MW01 through MW04) at the site on May 25, 2011. Boring logs and well construction diagrams are provided in Appendix A-6. The monitoring wells were installed at locations shown on Figure 2-1. Table 2-2 provides a summary of monitoring well construction information. The hollow-stem auger drilling technique was used for monitoring well drilling. Each monitoring well was installed to a depth of 13 feet bgs. The nominal diameter of the well borings was approximately 8 inches.

Each monitoring well was constructed of 2-inch, Schedule 40 polyvinyl chloride (PVC) flush-joint riser pipe; 10-foot-long flush-joint, factory-slotted, PVC well screen; and an end cap. Each section of casing and screen was National Sanitation Foundation approved and met American Society for Testing and Materials Standard A312-86a. The well screens had a slot size of 0.01 inch (10 slot) and were supplied with a flush-joint bottom cap.

After the riser pipe and screens were in place, the annular space was backfilled through the hollow-stem augers with U.S. Standard Sieve size No. 30-50 clean silica sand from the bottom of the boring to 1 foot above the top of the well screen. As the sand pack was installed, the augers were slowly retracted to provide an adequate sand pack around the well. The depths of construction materials were constantly monitored during the installation of the monitoring wells by using a weighted tape to confirm that no bridging of the annular material occurred during the installation process. A bentonite seal consisting of bentonite chips (approximately 1-foot thick) was then installed above the sand pack and allowed to hydrate in accordance with the manufacturer's recommendations.

A flush-mounted protective steel casing equipped with a sealed, bolted cap was installed over the four permanent wells. Each well riser pipe was secured with a locking J-plug. Each monitoring well was fitted with a 6-inch diameter by 10-inch long steel protective casing with an 8-inch lid. The annulus between the flush-mounted cover and the ground was filled with concrete. The soil cuttings from each monitoring well were collected in 55-gallon drums and labeled as investigation-derived waste (IDW) (see Section 2.5.3).

After the monitoring wells were installed, they were developed to remove fine materials (i.e., sands, silts, and clays) from the sand pack and the immediate area around the screened interval of the wells. The monitoring wells were developed no sooner than 24 hours after well completion to allow for settling/curing of the grout. Wells were developed by pumping using a submersible pump. During pumping, the well screens were periodically surged and the saturated screen interval was swept using the pump as a swab by pulling it up and down along the screen to remove the fine materials.

A field turbidity meter was used to measure turbidity during development. Wells were developed until a turbidity of 10 nephelometric turbidity units (NTU) was achieved, with a minimum of 10 casing volumes purged from each well (Appendix A-7). The purge water was containerized in 55-gallon drums.

2.4.2 Water Level Measurements

One round of synoptic water level measurements was collected from the monitoring wells to determine static water table elevations for groundwater. The synoptic measurements were collected within a 10-minute period of consistent weather conditions to minimize atmospheric/precipitation effects on groundwater levels. Measurements were collected with an electronic water level indicator using the top of the well casing (i.e., riser pipe) as the reference point for determining the depth to water. Water level measurements were collected at the mark made by the surveyor with a permanent marker at the top of each PVC casing for consistent measurements during subsequent rounds. The depth to the surface of the Detroit River was also measured from a surveyed point on the slip.

Water levels were measured to the nearest 0.01 foot. Table 2-2 and Appendix A-9 provide a summary of the groundwater level measurements collected.

2.4.3 Groundwater Sampling

Groundwater samples for the SI were collected on June 6, 2011. Table 2-1 provides a summary of the groundwater samples collected.

The monitoring wells were purged and sampled using low-flow purging techniques (low flow) in accordance with the FSPG&S (TtNUS, 2011a). A peristaltic pump and disposable polyethylene tubing was used to purge from the wells. Prior to purging, the intake of the sampling pump was placed at the approximate midpoint of the well screen or the midpoint of the water column present in the well, and at least 2 feet from the bottom of the well.

To start purging, the monitoring well pumping was conducted at a low flow rate to minimize drawdown. Water quality parameters [pH, temperature, specific conductance, turbidity, oxygen reduction potential (ORP), and dissolved oxygen (DO)] were measured and recorded at 5- to 10-minute intervals (Appendix A-8). Measurements were collected until the parameters stabilized for at least three consecutive readings within 10-percent, two to three consecutive turbidity measurements below 10 NTU, and the minimum purge volume (one screen volume) was removed. Purge water was containerized in 55-gallon drums.

After the parameters stabilized and immediately prior to sampling, the temperature, pH, specific conductance, turbidity, ORP, and DO of the groundwater sample were measured and recorded on a

Groundwater Sample Log Sheet (Appendix A-8). The sample containers were filled by allowing the pump discharge to flow with minimal turbulence down the inside of the container. For the collection of dissolved metals filtered samples, an in-line 0.45-micron, disposable filter was used.

The yield of each well was sufficient to maintain target purging low-flow rates. None of the wells were pumped dry.

Groundwater Sample Log Sheets are provided in Appendix A-8. The results of the groundwater sample analysis are presented in Section 3.0.

2.4.4 Quarterly Groundwater Monitoring

Quarterly groundwater samples were collected on September 14, 2011, December 16, 2011, and March 6, 2012. Samples were collected from the same wells and analyzed for the same constituents as described in Section 2.4.3. Summary reports for each event are included in Appendix F.

2.5 ANALYTICAL PARAMETERS AND METHODS

The following subsection summarizes analysis of soil and groundwater samples that were collected for the project. Table 2-1 presents the analytical parameters. Samples collected for chemical analysis during the SI and quarterly events were analyzed by Trimatrix Laboratories of Grand Rapids, Michigan.

2.5.1 Soil Samples

The soil samples were collected as described in Section 2.4. Soil samples collected for chemical analysis were analyzed for PAHs and Michigan 10 metals.

2.5.2 Groundwater Samples

The groundwater samples were collected as described in Section 2.4.3. Groundwater samples collected for chemical analysis were analyzed for PAHs and total and dissolved metals (Michigan 10).

2.5.3 IDW Samples

Following the SI field work, soil samples were submitted for laboratory testing to characterize the IDW for appropriate disposal via Toxicity Characteristic Leaching Procedure (TCLP) analysis for VOCs, metals, and pH. Groundwater analyses were used to characterize development water and purge water. Completed Waste Profiles were signed and are provided in Appendix C. The IDW was handled in accordance with the FSP (TtNUS, 2010a) and FSPG&S (TtNUS, 2011a).

2.6 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLE DESCRIPTION

The QAPP (TtNUS, 2010b) and QAPPA (TtNUS, 2011b) were used to monitor and assess the quality of field work and laboratory work performed during the SI. This program included the collection of various types of Quality Control (QC) samples as described below. The field QC samples consisted of temperature blanks, field duplicates, matrix spike/matrix spike duplicate (MS/MSD), and laboratory duplicates.

Temperature blanks were included in each cooler submitted to the laboratory to monitor sample temperature conditions prior to arrival at the laboratory. One field duplicate sample was collected per ten samples. The purpose of the field duplicate sample was to examine the variability of the samples.

MS samples were analyzed to provide information about the effect of the sample matrix on the digestion and measurement methodology. The MS for organic analysis were performed in duplicate (MSD). MS and MSD samples were collected at a frequency of 1 per 20 samples.

Each type of field QC sample had the same preservation, analysis, and reporting procedures as the related environmental samples with the exception of temperature blanks.

Laboratory QC samples consisted of laboratory control samples, laboratory duplicates, internal standards, laboratory method blanks, MS, MSD, post digestion spikes, and surrogates. Trimatrix Laboratories conducted the laboratory analysis and QC in accordance with the FSP (TtNUS, 2010a), FSPG&S (TtNUS, 2011a), QAPP (TtNUS, 2010b), and QAPPA (TtNUS, 2011b). TtNUS reviewed the laboratory quality control during the data validation, and noncompliances were noted in the data validation memoranda in Appendix B.

2.7 FIELD DOCUMENTATION

Field documentation and tracking of sample custody were integral portions of the overall quality assurance (QA)/QC process for the SI and quarterly monitoring. The field documentation system serves as a record of activities conducted in the field during sample collection and data generation, and provided the means to identify, track, and monitor each sample from the time of collection through final reporting of data.

2.7.1 Sample Identification

The sample identification scheme presented in the FSP (TtNUS, 2010a) and FSPG&S (TtNUS, 2011a) were used to identify and label the field samples and the field QC samples. The sample identification procedure was used for the sample labels and chain-of-custody documents in order to maintain consistency in the labeling process and to allow efficient handling of samples.

2.7.2 Sample Log Sheets

A field notebook and data sheets containing pertinent information regarding the samples was maintained. The field logs are intended to provide sufficient data and observations to enable the field team and other interested parties to reconstruct events that occurred during field activities.

Boring logs and well construction diagrams were prepared for the soil borings and monitoring wells. The physical characteristics of these samples (e.g., color, lithology, general appearance, odor, etc.) were recorded on a sample log sheet. Similarly, sample logs were prepared for groundwater samples.

2.8 SAMPLE MANAGEMENT

Strict chain-of-custody procedures for samples were maintained throughout the duration of the investigation. These procedures included the following:

- A chain-of-custody record was completed in the field. The original accompanied the samples, and copies were maintained at intermediate steps.

- At the point where the responsibility for custody of the samples changed, the new custodian signed the chain-of-custody record and noted the date and time.

SI samples were packed in an ice-filled cooler and couriered to the analytical laboratory by the laboratory or shipped by FedEx. Chain-of-custody forms for the SI are provided in Appendix A-11. The chain-of-custody forms for the quarterly monitoring are included with the individual reports in Appendix F.

2.9 INVESTIGATION-DERIVED WASTE MANAGEMENT

The types of wastes generated as a result of the SI activities were drill cuttings (soil), disposable sampling equipment, personal protective equipment (PPE), decontamination liquids, and development and purge water. The solid and liquid IDW was collected and placed in 55-gallon drums. The waste containers were clearly identified and labeled. The IDW was temporarily stored onsite until removed by the IDW

disposal subcontractor, Earth Smart Environmental Solutions, LLC (Earth Smart). Analytical results were provided to Earth Smart for manifesting, transportation, and disposal of the IDW (Appendix C).

2.10 SURVEYING

Surveying was conducted to determine the horizontal locations of borings and the horizontal locations, and vertical elevations of the ground surface and top of casing of the monitoring wells. Surveying was conducted by Tetra Tech-IER, a Michigan-licensed surveyor. Locations were reported in Michigan State Plane Coordinate System North American Datum 1983 (NAD 83), and vertical elevations were reported in North American Vertical Datum (NAVD) 88. The survey information is provided in Appendix D.

TABLE 2-1

SAMPLE SUMMARY
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Sample Name	Sample Date	Depth (feet bgs)	PAHs	TAL Metals	Mercury	Total Metals	Dissolved Metals
SURFACE SOIL [1]							
DASB101-0002	April 2010	0-2	X	X			
DASB102-0002	April 2010	0-2	X	X			
DASB102-0002A	May 2011	0-2	X		X		
DASB103-0002	April 2010	0-2	X	X			
DASB104-0002	April 2010	0-2	X	X			
DASB104-0002A	May 2011	0-2	X		X		
DASB105-0002	April 2010	0-2	X	X			
DASB106-0002	April 2010	0-2	X	X			
DASB106-0002A	May 2011	0-2	X		X		
DASB107-0002	April 2010	0-2	X	X			
DASB108-0002	April 2010	0-2	X	X			
DASB109-0002	April 2010	0-2	X	X			
DASB109-0002A	May 2011	0-2	X		X		
DASB110-0002	April 2010	0-2	X	X			
DASB110-0002A	May 2011	0-2	X		X		
DASB111-0002	April 2010	0-2	X	X			
DASB111-0002A	May 2011	0-2	X		X		
DASB112-0002	April 2010	0-2	X	X			
DASB112-0002A	May 2011	0-2	X		X		
DASB114-0002	April 2010	0-2	X	X			
DASB115-0002	April 2010	0-2	X	X			
DASB115-0002A	May 2011	0-2	X		X		
SUBSURFACE SOIL							
DASB101-0305	April 2010	3-5	X	X			
DASB102-0305	April 2010	3-5	X	X			
DASB102-0406A	May 2011	4-6	X		X		
DASB103-0305	April 2010	3-5	X	X			
DASB104-0305	April 2010	3-5	X	X			
DASB104-0204A	May 2011	2-4	X		X		
DASB105-0305	April 2010	3-5	X	X			
DASB106-0305	April 2010	3-5	X	X			
DASB106-0204A	May 2011	2-4	X		X		
DASB107-0204	April 2010	2-4	X	X			
DASB108-0305	April 2010	3-5	X	X			
DASB109-0305	April 2010	3-5	X	X			
DASB109-0204A	May 2011	2-4	X		X		
DASB110-0305	April 2010	3-5	X	X			
DASB110-0305A	May 2011	3-5	X		X		
DASB111-0305	April 2010	3-5	X	X			
DASB111-0305A	May 2011	3-5	X		X		
DASB112-0305	April 2010	3-5	X	X			
DASB112-0204A	May 2011	2-4	X		X		
DASB114-0305	April 2010	3-5	X	X			
DASB115-0305	April 2010	3-5	X	X			
DASB115-0204A	May 2011	2-4	X		X		
GROUNDWATER							
MW01	June 2011	3-13	X			X	X
MW02	June 2011	3-13	X			X	X
MW03	June 2011	3-13	X			X	X
MW04	June 2011	3-13	X			X	X

Notes:
[1] Collected from the first interval below Asphalt or Concrete if encountered.
X - indicates that the analysis was performed.
bgs - below ground surface
TAL - Target Analyte List
PAHs - Polycyclic aromatic hydrocarbons

TABLE 2-2

WATER LEVEL MEASUREMENTS
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Well ID	Ground Surface Elevation (feet, NAVD 88)	Top of Casing (feet, NAVD 88)	Screened Interval		3/6/2012		12/16/2011		9/14/2011		6/6/2011	
			Top (feet bgs)	Bottom (feet bgs)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)
MW01	579.58	579.53	3.0	13.0	1.43	578.10	1.00	578.53	1.70	577.83	2.22	577.31
MW02	579.54	579.62	3.0	13.0	3.42	576.20	3.20	576.42	3.32	576.30	3.95	575.67
MW03	579.33	579.00	3.0	13.0	4.26	574.74	4.08	574.92	3.94	575.06	3.89	575.11
MW04	578.68	578.11	3.0	13.0	3.30	574.81	2.49	575.62	3.05	575.06	3.18	574.93
River Level	578.69	NA	NA	NA	4.78	573.91	4.20	574.49	4.50	574.19	3.85	574.84

Notes:
bgs - below ground surface
BTOC - below top of casing
NAVD - North American Vertical Datum
NA - Not Applicable

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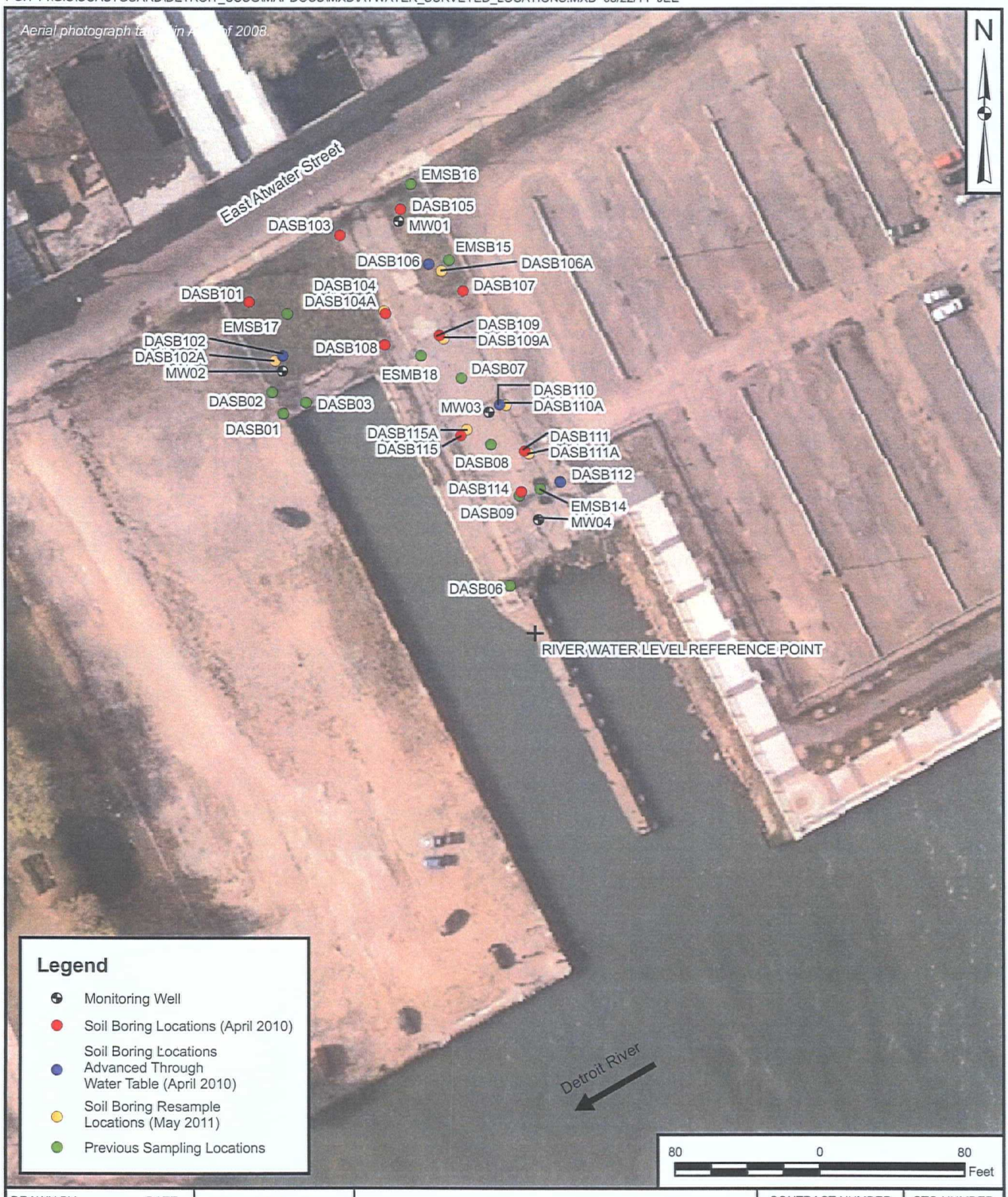

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DRAWN BY: J. ENGLISH	DATE: 07/29/11		MONITORING WELLS USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER: 02435	CTO NUMBER: ___
CHECKED BY: S. HILL	DATE: 08/16/11			APPROVED BY: ___	DATE: ___
REVISED BY:	DATE:			APPROVED BY: ___	DATE: ___
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3.0 INVESTIGATION RESULTS

3.1 DATA VALIDATION

The data validation was performed in accordance with the QAPP (TtNUS, 2010b) and QAPPA (TtNUS, 2011b). Several samples from the 2010 sampling event were rejected based on temperature exceedance of the cooler received by the laboratory. Because of this, samples DASS102-0002, DASB102-0406, DASS104-0204, DASB104-0204, DASS106-0002, DASB106-0204, DASS109-0002, DASB109-0204, DASS110-0002, DASB110-0305, DASS111-0002, DASB111-0305, DASS112-0002, DASB112-0204, DASS115-0002, and DASB115-0204 were resampled in 2011 for PAHs and mercury. These sample locations were next to the original sample locations and are denoted by an "A" at the end of the sample location, for example, SB102A in the resample location of SB102.

Additional documentation that summarizes the results of the data validation is provided in Appendix D and Appendix F.

The qualification flags used for this SI are defined per the QAPP (TtNUS, 2010b) and QAPPA (TtNUS, 2011b) as follows:

J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection (LOD).

U The analyte was analyzed for but not detected. The associated value is the LOD.

UR Nondetected sample results are rejected.

R Positive sample results are rejected.

The "R" and "UR" flags mean that the associated result is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no usable information as to whether the analyte is present or not. "R" and "UR" results should not appear on data tables because these data points are not considered reliable.

3.2 NATURE AND EXTENT OF CONTAMINATION

The investigation focused on surface and subsurface soil and groundwater for PAHs and metal impacts that were assumed to be present based on previous investigations and historical site activities.

It should be noted that originally groundwater was not anticipated to be investigated based on the previous ESAs where soil was noted to be mostly clay and non-water bearing. However, during the 2010 investigation groundwater accumulated overnight in temporary piezometers. Therefore, per the USEPA, TtNUS returned in 2011 to install monitoring wells and collect groundwater samples.

3.2.1 Soil

Analytical results from past sampling events identified elevated concentrations of PAHs and metals. As with the results from the ESAs, PAHs and metals were detected in all samples. The maximum concentrations of each PAH and metal were clustered in a few samples. The maximum PAH concentrations in surface soil samples were observed in SS105 and SS111. The maximum PAH concentrations in subsurface soil samples were observed in SB102A, SB106A, and SB107. The maximum metals concentrations in surface soil samples were observed in SS106, SS111, SS112, and SS114. The maximum metals concentrations in subsurface soil samples were observed in SB109, SB112, SB113, SB114, and SB115A.

Table 3-1 presents the positive detections for soil samples. Table 3-2 presents the descriptive statistics (i.e., frequency of detection and range of concentrations) for the surface soil samples. Table 3-3 presents the descriptive statistics for the subsurface soil samples. The complete data tables are located in Appendix B. The data tables in Appendix B also include the MDEQ criteria (residential exposure, industrial exposure, groundwater-surface water interface, and protection of drinking water).

3.2.2 Groundwater

Metals were detected in all groundwater samples. PAHs were detected in samples from only three of the monitoring wells. Concentrations of each metal and PAH were generally similar from well to well, although PAH and arsenic concentrations in monitoring well MW02 were notably greater than concentrations in the other wells. For a given well, the metal concentrations in the unfiltered sample were very similar to the concentrations in the filtered sample which indicates that the groundwater is relatively free from suspended solids.

Table 3-4 presents the positive detections for groundwater samples from the SI and quarterly events, and Table 3-5 presents the descriptive statistics for the groundwater samples from the SI that were used in the human health risk assessment. The complete data tables for the SI are located in Appendix B.

3.3 SITE-SPECIFIC GEOLOGY

Subsurface conditions at the site were characterized as part of the SI. Surface and subsurface materials at the site were characterized based on soil samples collected during the soil boring and well drilling.

The surface of the site is primarily grass covered in the north and concrete (significantly thicker as one approaches the river) to the south. Subsurface soil consists primarily of fill material and varies greatly throughout the site. Generally, the fill material is within a bed of sand and/or clay and the fill material increases toward the southern portion of the site (the river). Typically, the first 1 to 3 feet of subsurface soil was fill material that was noted to be primarily sand and silt with trace amounts of coal, brick, weathered wood, glass, cinder, and clinker. Below the sand layer, subsurface soil was noted to mostly consist of clay with interbedded layers of sand, gravel, and silt. During the first phase of the SI four locations (DASB102, DASB106, DASB110, and DASB112) were advanced to 15 feet bgs. Generally, interbedded layers of gravelly clay and sandy clay were observed in these deeper borings, with the exception of DASB106 where only clay was observed below 3 feet bgs. Following drilling, these locations were left open overnight to observe if groundwater would accumulate. Groundwater was observed, and USEPA deemed it necessary to investigate groundwater. Therefore, TtNUS subsequently installed monitoring wells as described in Section 2.4.

Soil boring logs are provided in Appendix A-2 (2010), A-3 (2011), and A-6 (2011 well construction boring logs).

3.4 SITE-SPECIFIC HYDROGEOLOGY

The hydrogeologic conditions at the Site were interpreted from data collected during the subsurface investigation activities at the site, including drilling, groundwater sampling, and groundwater level measurements.

3.4.1 Hydrogeologic Framework

The shallow water table was characterized at the Atwater Site during the SI and each quarterly monitoring event (see Table 2-2). The groundwater was measured at depths ranging from approximately 2.22 to 3.95 feet bgs during the SI. Over the course of the quarterly monitoring, depths to water varies from 1.0 to 4.26 feet below the ground surface. The water table principally occurred in the clayey unit at the site.

3.4.2 Groundwater Flow Direction

Groundwater flow direction for the shallow water table aquifer was determined based on the synoptic water level measurements collected during each groundwater sampling event (Table 2-2). Figures 3-1 through 3-4 present the potentiometric water table at the site. The flow direction of groundwater at the site is to the south toward the river.

3.5 IDW CHARACTERIZATION

All groundwater concentrations and TCLP leachate concentrations were less than the RCRA TCLP criteria. Based on the results of the IDW samples, groundwater samples, and previous samples, the IDW was determined to be non-hazardous and were disposed of off-site (see Appendix C).

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS101 DASS101-0002 20100421 0 2	DASB101 DASB101-0305 20100421 3 5	DASS102 DASS102-0002 20100420 0 2	DASS102A		
									DASS102A-0002 20110525 0 2	DASS102A-0002- 20110525 0 2	DASS102A-0002-D 20110525 0 2
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	5.7	7.6	5.7			
BARIUM	37000	130000	1300	440	75	59	90	56			
CADMIUM	550	2100	6	3	1.2	0.28	0.23	0.27			
CHROMIUM	2500	9200	30	3.3	18	15	18	14 J			
COPPER	20000	73000	5800	75	32	16	23	16			
LEAD	400	900	700	2500	2.1	31	180	34			
MERCURY	160	580	1.7	0.05	0.13	0.062	0.3 J		0.053	0.0675	0.082
SELENIUM	2600	9600	4	0.4	0.41	0.28	0.37	0.18			
SILVER	2500	9000	4.5	0.1	1	0.079	0.13	0.072			
ZINC	170000	630000	2400	170	47	62	93	62			
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC	4.5 J	7 J		270	141	12 J
ACENAPHTHENE	41000000	130000000	300	4.4	NC	13 J	23		120 J	83	46 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC	7.1 J	17 J		190 U	190 U	190 U
ANTHRACENE	230000000	730000000	41	NC	NC	59	110		250 J	175	100 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC	225	461		628	542	455
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC	180	490		540 J	430	320 J
BENZO(A)PYRENE	2000	8000	NC	NC	NC	150	310		400 J	340	280
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC	200	280		580 J	445	310 J
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC	110	150		220	185	150 J
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC	69	230		180 J	170	160 J
CHRYSENE	2000000	8000000	NC	NC	NC	170	430		580 J	435	290 J
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC	26	56		190 U	190 U	190 U
FLUORANTHENE	46000000	130000000	730	5.5	NC	370	860		1000	800	600
FLUORENE	27000000	87000000	390	5.3	NC	18 J	24		220	133	46 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC	98	150		190	170	150 J
NAPHTHALENE	16000000	52000000	35	0.87	NC	5.8 J	8.5 J		200	113.5	27 J
PHENANTHRENE	1600000	5200000	56	5.3	NC	210	370		1200 J	815	430 J
PYRENE	29000000	84000000	480	NC	NC	300	720		970 J	765	560 J

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASB102 DASB102-0305 20100420 3 5	DASB102A DASB102A-0406 20110525 4 6	DASB102A-0406- 20110525 4 6	DASB102A-0406-D 20110525 4 6	DASS103 DASS103-0002 20100421 0 2	DASB103 DASB103-0305 20100421 3 5
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	16				6.8	5
BARIUM	37000	130000	1300	440	75	82				49	36
CADMIUM	550	2100	6	3	1.2	0.21				0.18	0.19
CHROMIUM	2500	9200	30	3.3	18	14 J				13	13
COPPER	20000	73000	5800	75	32	37				14	13
LEAD	400	900	700	2500	2.1	140				43	12
MERCURY	160	580	1.7	0.05	0.13		0.32	0.305	0.29	0.044 J	0.031 J
SELENIUM	2600	9600	4	0.4	0.41	0.33				0.25	0.36
SILVER	2500	9000	4.5	0.1	1	0.098				0.085	0.074
ZINC	170000	630000	2400	170	47	90				45	39
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC		1800	1900	2000	3.1 J	19 U
ACENAPHTHENE	41000000	130000000	300	4.4	NC		380	445	510	8 J	19 U
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC		130 J	155	180 J	8.8 J	19 U
ANTHRACENE	230000000	730000000	41	NC	NC		450 J	725	1000 J	29	5.8 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC		972	1554	2135	217	30
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC		990 J	1545	2100 J	160	11 J
BENZO(A)PYRENE	2000	8000	NC	NC	NC		660 J	1030	1400 J	140	17 J
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC		860 J	1480	2100 J	210	19
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC		300 J	465	630 J	92	13 J
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC		400 J	670	940 J	71	8 J
CHRYSENE	2000000	8000000	NC	NC	NC		890 J	1445	2000 J	170	13 J
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC		190 U	167.5	240	31	19 U
FLUORANTHENE	46000000	130000000	730	5.5	NC		1700 J	2800	3900 J	320	24
FLUORENE	27000000	87000000	390	5.3	NC		920	1110	1300	11 J	1.9 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC		270 J	455	640 J	83	8.8 J
NAPHTHALENE	16000000	52000000	35	0.87	NC		1700	1600	1500	2.4 J	1.6 J
PHENANTHRENE	1600000	5200000	56	5.3	NC		3200 J	4650	6100 J	180	18 J
PYRENE	29000000	84000000	480	NC	NC		2000 J	2950	3900 J	280	24

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
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USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS104 DASS104-0002 20100420 0 2	DASS104A DASS104A-0002 20110525 0 2	DASB104 DASB104-0305 20100420 3 5	DASB104A DASB104A-0204 20110525 2 4	DASS105 DASS105-0002 20100421 0 2	DASB105 DASB105-0305 20100421 3 5
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	11		6.4		6.6	8.8
BARIUM	37000	130000	1300	440	75	110		47		74	66
CADMIUM	550	2100	6	3	1.2	0.79		0.17		0.3	0.24
CHROMIUM	2500	9200	30	3.3	18	18 J		16 J		17	14
COPPER	20000	73000	5800	75	32	79		14		29	60
LEAD	400	900	700	2500	2.1	360		16		85	93
MERCURY	160	580	1.7	0.05	0.13		0.19		0.15	0.24	0.16
SELENIUM	2600	9600	4	0.4	0.41	0.5		0.25		0.18	0.34
SILVER	2500	9000	4.5	0.1	1	0.15		0.076		0.1	0.12
ZINC	170000	630000	2400	170	47	270		56		87	79
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC		190 U		28 J	4300	27 J
ACENAPHTHENE	41000000	130000000	300	4.4	NC		49 J		120 J	980	19 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC		49 J		200 U	730 J	7.4 J
ANTHRACENE	230000000	730000000	41	NC	NC		220		230	2100	76 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC		1628		633	4212	296
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC		1400		520	3700	220
BENZO(A)PYRENE	2000	8000	NC	NC	NC		1200		410	2900	200
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC		1300		520	3200	250
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC		510		190 J	1500	110
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC		690		200	2300	96 J
CHRYSENE	2000000	8000000	NC	NC	NC		1100		460	3800	210
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC		190 U		200 U	950 U	37 J
FLUORANTHENE	46000000	130000000	730	5.5	NC		1900		1000	8400	420
FLUORENE	27000000	87000000	390	5.3	NC		46 J		110 J	2200	37 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC		550		170 J	1200	110
NAPHTHALENE	16000000	52000000	35	0.87	NC		23 J		28 J	3000	27 J
PHENANTHRENE	1600000	5200000	56	5.3	NC		680		830	13000	430
PYRENE	29000000	84000000	480	NC	NC		2100		900	8200	430

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
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LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS106 DASS106-0002 20100420 0 2	DASS106A DASS106A-0002 20110525 0 2	DASB106 DASB106-0305 20100420 3 5	DASB106A DASB106A-0204 20110525 2 4	DASS107 DASS107-0002 20100421 0 2	DASB107 DASB107-0204 20100421 2 4
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	6.4		5.5		8.7	9.4
BARIUM	37000	130000	1300	440	75	75		48		65	74
CADMIUM	550	2100	6	3	1.2	0.33		0.13		0.57	0.46
CHROMIUM	2500	9200	30	3.3	18	14 J		15 J		16	13
COPPER	20000	73000	5800	75	32	49		13		130	98
LEAD	400	900	700	2500	2.1	99		8.5		190	130
MERCURY	160	580	1.7	0.05	0.13		0.043 J		0.49	0.11	0.27
SELENIUM	2600	9600	4	0.4	0.41	0.78		0.1 U		0.32	0.36
SILVER	2500	9000	4.5	0.1	1	0.11		0.069		0.078	0.14
ZINC	170000	630000	2400	170	47	88		38		130	160
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC		200 U		92 J	15 J	220
ACENAPHTHENE	41000000	130000000	300	4.4	NC		200 U		290	20 J	440
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC		200 U		96 J	22 J	110
ANTHRACENE	230000000	730000000	41	NC	NC		140 J		580	82 J	840
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC		483		3307	335	2428
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC		400		3000	300	2600
BENZO(A)PYRENE	2000	8000	NC	NC	NC		290		2200	230	1600
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC		390		3000	360 J	1900
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC		120 J		780	140	830
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC		140 J		1200	57 J	1200
CHRYSENE	2000000	8000000	NC	NC	NC		350		2800	270	2800
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC		200 U		400	21 J	290
FLUORANTHENE	46000000	130000000	730	5.5	NC		740		4300	500	4300
FLUORENE	27000000	87000000	390	5.3	NC		200 U		330	26 J	430
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC		120 J		920	170	730
NAPHTHALENE	16000000	52000000	35	0.87	NC		200 U		160 J	10 J	220
PHENANTHRENE	1600000	5200000	56	5.3	NC		480		2500	310	2800
PYRENE	29000000	84000000	480	NC	NC		760		4400	530	3300

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
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LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS108 DASS108-0002 20100421 0 2	DASB108 DASB108-0305 20100421 3 5	DASS109 DASS109-0002 20100420 0 2	DASS109 DASS109-0002 20100420 0 2	DASS109 DASS109-0002-D 20100420 0 2	DASS109A DASS109A-0002 20110525 0 2
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	2.5	3.3	9.2	9.05	8.9	
BARIUM	37000	130000	1300	440	75	26	73	150	140	130	
CADMIUM	550	2100	6	3	1.2	0.16	0.15	0.45	0.45	0.45	
CHROMIUM	2500	9200	30	3.3	18	10	12	12 J	13	14 J	
COPPER	20000	73000	5800	75	32	8.7	12	71	69	67	
LEAD	400	900	700	2500	2.1	11	53	450	400	350	
MERCURY	160	580	1.7	0.05	0.13	0.018 J	0.28				0.031 J
SELENIUM	2600	9600	4	0.4	0.41	0.1 U	0.17	0.59	0.58	0.57	
SILVER	2500	9000	4.5	0.1	1	0.045 J	0.064	0.13	0.12	0.11	
ZINC	170000	630000	2400	170	47	31	46	200	195	190	
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC	36 U	20 U				1800 U
ACENAPHTHENE	41000000	130000000	300	4.4	NC	36 U	20 U				1800 U
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC	3.3 J	20 U				1800 U
ANTHRACENE	230000000	730000000	41	NC	NC	13 J	4.4 J				1800 U
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC	101	28				1556
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC	57	13 J				580 J
BENZO(A)PYRENE	2000	8000	NC	NC	NC	67	13 J				450 J
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC	65	23				550 J
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC	44	10 J				240 J
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC	45	6.5 J				210 J
CHRYSENE	2000000	8000000	NC	NC	NC	53	13 J				480 J
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC	36 U	20 U				1800 U
FLUORANTHENE	46000000	130000000	730	5.5	NC	81	24				580 J
FLUORENE	27000000	87000000	390	5.3	NC	3.8 J	20 U				1800 U
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC	36	8.7 J				1800 U
NAPHTHALENE	16000000	52000000	35	0.87	NC	36 U	20 U				1800 U
PHENANTHRENE	1600000	5200000	56	5.3	NC	51	12 J				550 J
PYRENE	29000000	84000000	480	NC	NC	76	24				1800

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
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LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASB109 DASB109-0305 20100420 3 5	DASB109A DASB109A-0204 20110525 2 4	DASS110 DASS110-0002 20100420 0 2	DASS110A DASS110A-0002 20110525 0 2	DASB110 DASB110-0305 20100420 3 5	DASB110A DASB110A-0305 20110525 3 5
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	**11**		**8.1**		6.9	
BARIUM	37000	130000	1300	440	75	110		140		59	
CADMIUM	550	2100	6	3	1.2	0.65		1.3		2.5	
CHROMIUM	2500	9200	30	3.3	18	10 J		11 J		14 J	
COPPER	20000	73000	5800	75	32	180		220		79	
LEAD	400	900	700	2500	2.1	**2400**		**480**		160	
MERCURY	160	580	1.7	0.05	0.13		0.55		0.37		0.11
SELENIUM	2600	9600	4	0.4	0.41	2.6		0.57		0.54	
SILVER	2500	9000	4.5	0.1	1	0.19		0.23		0.22	
ZINC	170000	630000	2400	170	47	260		660		210	
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC		210 U		19 J		2.8 J
ACENAPHTHENE	41000000	130000000	300	4.4	NC		210 U		190 U		5.6 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC		210 U		190 U		20 U
ANTHRACENE	230000000	730000000	41	NC	NC		85 J		75 J		8.4 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC		580		665		40
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC		390		470		35
BENZO(A)PYRENE	2000	8000	NC	NC	NC		370		440		22
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC		460		600		31
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC		190 J		220		12 J
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC		200 J		220		7.2 J
CHRYSENE	2000000	8000000	NC	NC	NC		370		450		29
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC		210 U		190 U		20 U
FLUORANTHENE	46000000	130000000	730	5.5	NC		620		800		33
FLUORENE	27000000	87000000	390	5.3	NC		210 U		190 U		5.6 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC		180 J		200		10 J
NAPHTHALENE	16000000	52000000	35	0.87	NC		13 J		23 J		2 J
PHENANTHRENE	1600000	5200000	56	5.3	NC		370		330		23
PYRENE	29000000	84000000	480	NC	NC		710		800		59

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
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LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS111 DASS111-0002 20100420 0 2	DASS111 DASS111-0002 20100420 0 2	DASS111 DASS111-0002-D 20100420 0 2	DASS111A DASS111A-0002 20110525 0 2	DASB111 DASB111-0305 20100420 3 5	DASB111A DASB111A-0305 20110525 3 5
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	7.6	7.9	8.2		4.7	
BARIUM	37000	130000	1300	440	75	110	125	140		61	
CADMIUM	550	2100	6	3	1.2	0.86	0.825	0.79		0.14	
CHROMIUM	2500	9200	30	3.3	18	13 J	12.5	12 J		17 J	
COPPER	20000	73000	5800	75	32	190	205	220		14	
LEAD	400	900	700	2500	2.1	370	340	310		11	
MERCURY	160	580	1.7	0.05	0.13				0.64		0.05
SELENIUM	2600	9600	4	0.4	0.41	0.5	0.525	0.55		0.14	
SILVER	2500	9000	4.5	0.1	1	0.2	0.185	0.17		0.085	
ZINC	170000	630000	2400	170	47	450 J	360	270 J		41	
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC				56 J		25 J
ACENAPHTHENE	41000000	130000000	300	4.4	NC				240		38 U
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC				89 J		38 U
ANTHRACENE	230000000	730000000	41	NC	NC				690		5.5 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC				3305		30
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC				2600		14 J
BENZO(A)PYRENE	2000	8000	NC	NC	NC				2300		7.8 J
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC				2900		10 J
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC				1100		7.8 J
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC				1300		7 J
CHRYSENE	2000000	8000000	NC	NC	NC				2300		15 J
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC				320		38 U
FLUORANTHENE	46000000	130000000	730	5.5	NC				4600		13 J
FLUORENE	27000000	87000000	390	5.3	NC				230		38 U
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC				1200		6.3 J
NAPHTHALENE	16000000	52000000	35	0.87	NC				63 J		10 J
PHENANTHRENE	1600000	5200000	56	5.3	NC				3400		32 J
PYRENE	29000000	84000000	480	NC	NC				5100		15 J

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SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS112 DASS112-0002 20100420 0 2	DASS112A DASS112A-0002 20110525 0 2	DASB112 DASB112-0305 20100420 3 5	DASB112A DASB112A-0204 20110525 2 4	DASS114 DASS114-0002 20100421 0 2	DASB114 DASB114-0305 20100421 3 5
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	**19**		7.6		7.3	**17**
BARIUM	37000	130000	1300	440	75	420		75		140	150
CADMIUM	550	2100	6	3	1.2	2.6		0.22		0.71	0.47
CHROMIUM	2500	9200	30	3.3	18	15 J		19 J		20 J	16
COPPER	20000	73000	5800	75	32	620		30		77	65
LEAD	400	900	700	2500	2.1	**970**		94		**410**	**760**
MERCURY	160	580	1.7	0.05	0.13		0.54		0.49	0.41 J	0.69
SELENIUM	2600	9600	4	0.4	0.41	0.6		0.42		0.5	1.9
SILVER	2500	9000	4.5	0.1	1	0.28		0.096		0.12	0.18
ZINC	170000	630000	2400	170	47	670		77		210	230
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC		17 J		9.5 J	360 U	69 J
ACENAPHTHENE	41000000	130000000	300	4.4	NC		10 J		40 U	360 U	18 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC		37 U		40 U	360 U	11 J
ANTHRACENE	230000000	730000000	41	NC	NC		29 J		13 J	92 J	77 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC		166		126	925	408
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC		140		86	600	250
BENZO(A)PYRENE	2000	8000	NC	NC	NC		110		81	560	280
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC		160		110	800	340
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC		70		52	510	200
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC		67		31 J	730	84 J
CHRYSENE	2000000	8000000	NC	NC	NC		120		75	920	280
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC		37 U		40 U	360 U	100 U
FLUORANTHENE	46000000	130000000	730	5.5	NC		160		110	860	420
FLUORENE	27000000	87000000	390	5.3	NC		14 J		40 U	360 U	22 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC		64		48	370	180
NAPHTHALENE	16000000	52000000	35	0.87	NC		15 J		5.5 J	34 J	45 J
PHENANTHRENE	1600000	5200000	56	5.3	NC		130		69	360	270
PYRENE	29000000	84000000	480	NC	NC		250		140	800	450

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASS115 DASS115-0002 20100420 0 2	DASS115 DASS115-0002 20100420 0 2	DASS115 DASS115-0002-D 20100420 0 2	DASS115A DASS115A-0002 20110525 0 2	DASB115 DASB115-0305 20100420 3 5	DASB115A DASB115A-0204 20110525 2 4
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	8.4	8.6	8.8		5.5	
BARIUM	37000	130000	1300	440	75	100	105	110		95	
CADMIUM	550	2100	6	3	1.2	0.42	0.47	0.52		0.25	
CHROMIUM	2500	9200	30	3.3	18	14 J	15	16 J		16 J	
COPPER	20000	73000	5800	75	32	85	97.5	110		26	
LEAD	400	900	700	2500	2.1	280	290	300		140	
MERCURY	160	580	1.7	0.05	0.13				0.54		1.3
SELENIUM	2600	9600	4	0.4	0.41	0.74	0.74	0.74		0.45	
SILVER	2500	9000	4.5	0.1	1	0.095	0.0975	0.1		0.13	
ZINC	170000	630000	2400	170	47	140	160	180		110	
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC				1900 U		41 J
ACENAPHTHENE	41000000	130000000	300	4.4	NC				1900 U		120 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC				1900 U		200 U
ANTHRACENE	230000000	730000000	41	NC	NC				1900 U		310
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC				1610		976
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC				500 J		760
BENZO(A)PYRENE	2000	8000	NC	NC	NC				460 J		670
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC				500 J		950
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC				530 J		330
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC				420 J		280
CHRYSENE	2000000	8000000	NC	NC	NC				460 J		680
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC				1900 U		200 U
FLUORANTHENE	46000000	130000000	730	5.5	NC				610 J		1400
FLUORENE	27000000	87000000	390	5.3	NC				1900 U		95 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC				1900 U		320
NAPHTHALENE	16000000	52000000	35	0.87	NC				1900 U		33 J
PHENANTHRENE	1600000	5200000	56	5.3	NC				690 J		1100
PYRENE	29000000	84000000	480	NC	NC				1800 J		1500

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASB01 DASB010607 20020814 4 5	DASB01 DASB010607-AVG 20020814 4 5	DASB01 DASB010607-D 20020814 4 5	DASB02 DASB020607 20020814 4.5 5.5	DASB03 DASB030406 20020814 1 3	DASB06 DASB061112 20020814 8.5 9
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8						
BARIUM	37000	130000	1300	440	75						
CADMIUM	550	2100	6	3	1.2						
CHROMIUM	2500	9200	30	3.3	18						
COPPER	20000	73000	5800	75	32						
LEAD	400	900	700	2500	2.1	9.1	9.1		91.1	454	10.7
MERCURY	160	580	1.7	0.05	0.13						
SELENIUM	2600	9600	4	0.4	0.41						
SILVER	2500	9000	4.5	0.1	1						
ZINC	170000	630000	2400	170	47						
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC	200 U	200 U	200 U	210 U	200 U	
ACENAPHTHENE	41000000	130000000	300	4.4	NC	200 U	200 U	200 U	42.7 J	200 U	
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC	200 U	200 U	200 U	210 U	480	
ANTHRACENE	230000000	730000000	41	NC	NC	200 U	200 U	200 U	61.1 J	261	
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC	200 U	172	172	275	1664	
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC	200 U	45.1 J	45.1 J	149 J	812	
BENZO(A)PYRENE	2000	8000	NC	NC	NC	200 U	50.5 J	50.5 J	128 J	1160	
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC	200 U	63.6 J	63.6 J	154 J	865	
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC	200 U	200 U	200 U	85.8 J	1180	
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC	200 U	200 U	200 U	58 J	308	
CHRYSENE	2000000	8000000	NC	NC	NC	200 U	46.3 J	46.3 J	146 J	898	
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC	200 U	200 U	200 U	210 U	233	
FLUORANTHENE	46000000	130000000	730	5.5	NC	200 U	69.8 J	69.8 J	321	875	
FLUORENE	27000000	87000000	390	5.3	NC	200 U	200 U	200 U	210 U	200 U	
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC	200 U	200 U	200 U	210 U	989	
NAPHTHALENE	16000000	52000000	35	0.87	NC	200 U	200 U	200 U	210 U	44.2 J	
PHENANTHRENE	1600000	5200000	56	5.3	NC	200 U	200 U	200 U	209 J	356	
PYRENE	29000000	84000000	480	NC	NC	200 U	200 U	200 U	287	1360	

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	DASB07 DASB070304 20020814 1 2	DASB08 DASB080304 20020814 2 3	DASB08 DASB080304-AVG 20020814 2 3	DASB08 DASB080304-D 20020814 2 3	DASB09 DASB090304 20020814 1 2
METALS (MG/KG)										
ARSENIC	7.6	37	4.6	23	5.8	**10.2**	**13.7**	**13.45**	**13.2**	**23.9**
BARIUM	37000	130000	1300	440	75	459	251	435	619	122
CADMIUM	550	2100	6	3	1.2	0.35	0.32	0.315	0.31	0.3
CHROMIUM	2500	9200	30	3.3	18	7.3	8.7	8.45	8.2	10.4
COPPER	20000	73000	5800	75	32					
LEAD	400	900	700	2500	2.1	**1070**	**401**	**539**	**677**	338
MERCURY	160	580	1.7	0.05	0.13	0.45	0.98	0.665	0.35	1.1
SELENIUM	2600	9600	4	0.4	0.41	1.8	3.6	6.15	8.7	3.8
SILVER	2500	9000	4.5	0.1	1	0.07	0.21	0.225	0.24	0.2
ZINC	170000	630000	2400	170	47					
PAHs (UG/KG)										
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC	488	75.6 J	75.6 J		200 U
ACENAPHTHENE	41000000	130000000	300	4.4	NC	1350	97.2 J	97.2 J		46.6 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC	298	73.5 J	73.5 J		69.6 J
ANTHRACENE	230000000	730000000	41	NC	NC	2370	340	340		166 J
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC	**6328**	1023	1023		860
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC	4810	807	807		650
BENZO(A)PYRENE	2000	8000	NC	NC	NC	**4510**	711	711		594
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC	5030	804	804		673
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC	4080	401	401		339
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC	1740	267	267		209
CHRYSENE	2000000	8000000	NC	NC	NC	4620	753	753		666
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC	451	99.7 J	99.7 J		92.5 J
FLUORANTHENE	46000000	130000000	730	5.5	NC	11100	1940	1940		1370
FLUORENE	27000000	87000000	390	5.3	NC	1660	128 J	128 J		59 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC	3610	474	474		382
NAPHTHALENE	16000000	52000000	35	0.87	NC	1860	45.1 J	45.1 J		200 U
PHENANTHRENE	1600000	5200000	56	5.3	NC	8430	1220	1220		573
PYRENE	29000000	84000000	480	NC	NC	10800	1150	1150		830

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION SAMPLE ID SAMPLE DATE TOP DEPTH BOTTOM DEPTH	Michigan Residential Exposure Criteria	Michigan Industrial Exposure Criteria	Michigan Drinking Water Protection Criteria	Michigan GSI Criteria	Michigan State-wide Background	EMSB14 DASB14_04-05.5 20060425 4 5.5	EMSB14 DASB14_09-10.5 20060425 9 10.5	EMSB15 DASB15_01.5-03 20060425 1.5 3	EMSB16 DASB16_04-05.5 20060425 4 5.5	EMSB17 DASB17_01.5-03 20060425 1.5 3	EMSB18 DASB18_06.5-08 20060425 6.5 8
METALS (MG/KG)											
ARSENIC	7.6	37	4.6	23	5.8	11	7.8	6.3	7.5	8.4	7
BARIUM	37000	130000	1300	440	75	440	110	67	55	92	57
CADMIUM	550	2100	6	3	1.2	0.6	0.53	0.54	0.45	0.67	0.37 J
CHROMIUM	2500	9200	30	3.3	18	15	16	15	12	18	14
COPPER	20000	73000	5800	75	32	99	36	82	110	68	26
LEAD	400	900	700	2500	2.1	510	120	66	57	260	85
MERCURY	160	580	1.7	0.05	0.13	0.28	0.14	0.17	1.1	0.21	0.73
SELENIUM	2600	9600	4	0.4	0.41	0.63	0.48 U	0.85	0.42 J	0.64	0.88
SILVER	2500	9000	4.5	0.1	1	0.3	0.17 J	0.074 J	0.14 J	0.13 J	0.16 J
ZINC	170000	630000	2400	170	47	380	120	110	85	130	61
PAHs (UG/KG)											
2-METHYLNAPHTHALENE	8100000	26000000	57	NC	NC	210 J	37 J	370 U	42 J	430 J	2000 U
ACENAPHTHENE	41000000	130000000	300	4.4	NC	1700 J	48 J	370 U	390 U	440 J	720 J
ACENAPHTHYLENE	1600000	5200000	5.9	NC	NC	2400 U	420 U	370 U	390 U	550 J	610 J
ANTHRACENE	230000000	730000000	41	NC	NC	3000	110 J	370 U	38 J	1400 J	2800
BAP EQUIVALENT-HALFND	2000	8000	NC	NC	NC	4366	343	259	359	4099	7849
BENZO(A)ANTHRACENE	20000	80000	NC	NC	NC	2900	130 J	46 J	170 J	4000	6600
BENZO(A)PYRENE	2000	8000	NC	NC	NC	2400	99 J	43 J	120 J	2700	5500
BENZO(B)FLUORANTHENE	20000	80000	NC	NC	NC	3200	140 J	61 J	190 J	3900	6800
BENZO(G,H,I)PERYLENE	2500000	7000000	NC	NC	NC	1400 J	51 J	370 U	60 J	1200 J	2200
BENZO(K)FLUORANTHENE	200000	800000	NC	NC	NC	1200 J	63 J	370 U	390 U	1500 J	3200
CHRYSENE	2000000	8000000	NC	NC	NC	3900	200 J	64 J	160 J	3700	6600
DIBENZO(A,H)ANTHRACENE	2000	8000	NC	NC	NC	2400 U	420 U	370 U	390 U	470 J	730 J
FLUORANTHENE	46000000	130000000	730	5.5	NC	9200	380 J	120 J	340 J	7700	17000
FLUORENE	27000000	87000000	390	5.3	NC	2900	71 J	370 U	390 U	1000 J	1200 J
INDENO(1,2,3-CD)PYRENE	20000	80000	NC	NC	NC	1400 J	61 J	370 U	57 J	1200 J	2400
NAPHTHALENE	16000000	52000000	35	0.87	NC	330 J	77 J	370 U	47 J	330 J	480 J
PHENANTHRENE	1600000	5200000	56	5.3	NC	14000	460	88 J	220 J	7500	5500
PYRENE	29000000	84000000	480	NC	NC	7500	320 J	100 J	260 J	6800	14000

Black shading indicates concentration greater than residential criterion.
Grey indicates concentration greater than both residential and industrial criteria.
Blanks indicate that no analysis was performed.
A letter "A" in the Location and Sample ID indicates that the result is from the re-sampling in May 2011.
J - Estimated Concentration.
U - Below detection limit at detection limit shown.
BAP EQUIVALENT - HALFND - Benzo(a)pyrene equivalents. Where a PAH is not detected, 1/2 of the detection limit is used in the calculation.
bgs - Below ground surface.
GSI - Groundwater - surface water interface.
MCL - Maximum Contaminant Level.
NC - No criterion.
PAHs - Polycyclic aromatic hydrocarbons..
RBSL - Risk-Based Screening Level
See Appendix for VOC and SVOC results from ESA investigations.

TABLE 3-2

DESCRIPTIVE STATISTICS FOR SURFACE SOIL SAMPLES
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT MICHIGAN

Parameter	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Range of Non-Detects	Sample with Maximum Detection
Inorganics (mg/kg)					
Arsenic	14/14	2.5	19	-	DASS112-0002
Barium	14/14	26	420	-	DASS112-0002
Cadmium	14/14	0.16	2.6	-	DASS112-0002
Chromium	14/14	10	20	-	DASS114-0002
Copper	14/14	8.7	620	-	DASS112-0002
Lead	14/14	11	970	-	DASS112-0002
Mercury	14/14	0.018	0.64	-	DASS111-0002
Selenium	13/14	0.18	0.78	0.1	DASS106-0002
Silver	14/14	0.045	0.28	-	DASS112-0002
Zinc	14/14	31	670	-	DASS112-0002
PAHs (mg/kg)					
2-Methylnaphthalene	8/14	0.0031	4.3	0.036 - 1.9	DASS105-0002
Acenaphthene	8/14	0.008	0.98	0.036 - 1.9	DASS105-0002
Acenaphthylene	7/14	0.0033	0.73	0.037 - 1.9	DASS105-0002
Anthracene	12/14	0.013	2.1	1.8 - 1.9	DASS105-0002
Benzo(a)anthracene	14/14	0.057	3.7	-	DASS105-0002
Benzo(a)pyrene	14/14	0.067	2.9	-	DASS105-0002
Benzo(b)fluoranthene	14/14	0.065	3.2	-	DASS105-0002
Benzo(g,h,i)perylene	14/14	0.044	1.5	-	DASS105-0002
Benzo(k)fluoranthene	14/14	0.045	2.3	-	DASS105-0002
Chrysene	14/14	0.053	3.8	-	DASS105-0002
Dibenzo(a,h)anthracene	4/14	0.021	0.32	0.036 - 1.9	DASS111-0002
Fluoranthene	14/14	0.081	8.4	-	DASS105-0002
Fluorene	9/14	0.0038	2.2	0.19 - 1.9	DASS105-0002
Indeno(1,2,3-cd)pyrene	12/14	0.036	1.2	1.8 - 1.9	DASS105-0002
Indeno(1,2,3-cd)pyrene	12/14	0.036	1.2	1.8 - 1.9	DASS111-0002
Naphthalene	10/14	0.0024	3	0.036 - 1.9	DASS105-0002
Phenanthrene	14/14	0.051	13	-	DASS105-0002
Pyrene	14/14	0.076	8.2	-	DASS105-0002

Associated Samples:

DASS101-0002,NORMAL
DASS102-0002,DUP
DASS102-0002,NORMAL
DASS102-0002-AVG,AVG
DASS102-0002-D,DUP
DASS103-0002,NORMAL
DASS104-0002,NORMAL
DASS105-0002,NORMAL
DASS106-0002,NORMAL
DASS107-0002,NORMAL
DASS108-0002,NORMAL
DASS109-0002,DUP
DASS109-0002,NORMAL
DASS109-0002-AVG,AVG
DASS109-0002-D,DUP
DASS110-0002,NORMAL
DASS111-0002,DUP
DASS111-0002,NORMAL
DASS111-0002-AVG,AVG
DASS111-0002-D,DUP
DASS112-0002,NORMAL
DASS114-0002,NORMAL
DASS115-0002,DUP
DASS115-0002,NORMAL
DASS115-0002-AVG,AVG
DASS115-0002-D,DUP

TABLE 3-3

DESCRIPTIVE STATISTICS FOR SUBSURFACE SOIL
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT MICHIGAN

Parameter	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Range of Non-Detects	Sample with Maximum Detection
Inorganics (mg/kg)					
Arsenic	14/14	3.3	17	-	DASB114-0305
Barium	14/14	36	150	-	DASB114-0305
Cadmium	14/14	0.13	2.5	-	DASB110-0305
Chromium	14/14	10	19	-	DASB112-0305
Copper	14/14	12	180	-	DASB109-0305
Lead	14/14	8.5	2400	-	DASB109-0305
Mercury	14/14	0.031	1.3	-	DASB115A-0204
Selenium	13/14	0.14	2.6	0.1	DASB109-0305
Silver	14/14	0.064	0.22	-	DASB110-0305
Zinc	14/14	38	260	-	DASB109-0305
PAHs (mg/kg)					
2-Methylnaphthalene	11/14	0.0028	2	0.019 - 0.21	DASB102A-0406-D
Acenaphthene	9/14	0.0056	0.51	0.019 - 0.21	DASB102A-0406-D
Acenaphthylene	6/14	0.0074	0.18	0.019 - 0.21	DASB102A-0406-D
Anthracene	14/14	0.0044	1	-	DASB102A-0406-D
Benzo(a)anthracene	14/14	0.011	3	-	DASB106A-0204
Benzo(a)pyrene	14/14	0.0078	2.2	-	DASB106A-0204
Benzo(b)fluoranthene	14/14	0.01	3	-	DASB106A-0204
Benzo(g,h,i)perylene	14/14	0.0078	0.83	-	DASB107-0204
Benzo(k)fluoranthene	14/14	0.0065	1.2	-	DASB106A-0204
Benzo(k)fluoranthene	14/14	0.0065	1.2	-	DASB107-0204
Chrysene	14/14	0.013	2.8	-	DASB106A-0204
Chrysene	14/14	0.013	2.8	-	DASB107-0204
Dibenzo(a,h)anthracene	5/14	0.037	0.4	0.019 - 0.21	DASB106A-0204
Fluoranthene	14/14	0.013	4.3	-	DASB106A-0204
Fluoranthene	14/14	0.013	4.3	-	DASB107-0204
Fluorene	10/14	0.0019	1.3	0.02 - 0.21	DASB102A-0406-D
Indeno(1,2,3-cd)pyrene	14/14	0.0063	0.92	-	DASB106A-0204
Naphthalene	13/14	0.0016	1.7	0.02	DASB102A-0406
Phenanthrene	14/14	0.012	6.1	-	DASB102A-0406-D
Pyrene	14/14	0.015	4.4	-	DASB106A-0204

Associated Samples:

DASB101-0305,NORMAL
DASB102-0305,NORMAL
DASB102A-0406,DUP
DASB102A-0406-AVG,AVG
DASB102A-0406-D,DUP
DASB103-0305,NORMAL
DASB104-0305,NORMAL
DASB104A-0204,NORMAL
DASB105-0305,NORMAL
DASB106-0305,NORMAL
DASB106A-0204,NORMAL
DASB107-0204,NORMAL
DASB108-0305,NORMAL
DASB109-0305,NORMAL
DASB109A-0204,NORMAL
DASB110-0305,NORMAL
DASB110A-0305,NORMAL
DASB111-0305,NORMAL
DASB111A-0305,NORMAL
DASB112-0305,NORMAL
DASB112A-0204,NORMAL
DASB114-0305,NORMAL
DASB115-0305,NORMAL
DASB115A-0204,NORMAL

TABLE 3-4

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR MARCH 2012 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 2

LOCATION	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	DAMW01				DAMW02					
SAMPLE DATE					6/6/2011	9/14/2011	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	12/16/2011-D	3/6/2012	3/6/2012-D
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)														
ARSENIC	10	10	10	10	0.95 J	0.73 J	0.36 J	0.6 J	1 J	9	9.3	9.2	12	12
BARIUM	2000	2000	670	2000	190 J	300	260	250	200 J	150	110	100	87	89
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.14 J	0.2 U	0.2 U	0.2 U	0.058 J	0.046 J	0.2 U	0.2 U
CHROMIUM	100	100	100	100	0.3 J	0.27 J	1 U	1 U	0.47 J	0.45 J	0.36 J	0.37 J	1 U	1 U
COPPER	1300	1000	13	1300	0.44 J	0.61 J	0.28 J	1 U	0.42 J	0.16 J	1 U	0.28 J	1 U	1 U
LEAD	15	2	14	15	0.17 J	0.18 J	1 U	1 UJ	0.2 J	1 U	1 U	1 U	1 UJ	1 UJ
SELENIUM	50	50	5	50	5 UJ	1.1 J	5 U	5 U	5 UJ	5 UJ	5 U	5 U	0.39 J	1.3 J
ZINC	NC	2400	170	2400	5.5	6.7	6.5 U	10 U	5 U	5 U	6.9 U	7.8 U	10 U	10 U
TOTAL METALS (UG/L)														
ARSENIC	10	10	10	10	1.5 J	1 J	0.52 J	0.63 J	6.2	12	9.5	10	14	14
BARIUM	2000	2000	670	2000	210	300	260	240	150	160	110	110	86	84
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.79 J	0.06 J	0.2 U	0.2 U	0.73 J	0.054 J	0.1 J	0.11 J
CHROMIUM	100	100	100	100	0.31 J	0.25 J	0.57 J	1 U	0.33 J	0.51 J	0.39 J	0.38 J	1 U	1.3 U
COPPER	1300	1000	13	1300	0.74 J	0.79 J	0.98 J	1 U	1.2	0.29 J	0.19 J	0.39 J	1 U	1 U
LEAD	15	2	14	15	0.73 J	1	0.63 J	0.26 J	0.85 J	0.39 J	0.16 J	0.23 J	1 U	1 U
SELENIUM	50	50	5	50	5 UJ	5 UJ	5 U	5 U	1 J	1.5 J	5 U	5 U	5 U	0.55 J
ZINC	NC	2400	170	2400	6.9 J	9.4	10	4 J	3.9 J	6.4	8.6	10	7.6 J	3.2 J
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)														
2-METHYLNAPHTHALENE	NC	260	19	260	0.5 U	0.5 U	0.5 U	0.5 U	24 J	43	42	33	50	49
ACENAPHTHENE	NC	1300	38	1300	0.5 U	0.031 J	0.5 U	0.03 J	6 J	14	10	7.7 J	6.9	6.6
ACENAPHTHYLENE	NC	52	ID	52	0.5 U	0.5 U	0.5 U	0.5 U	1.7 J	3.8 J	3.7 J	2.6 J	3.9 J	3.7 J
ANTHRACENE	NC	43	ID	43	0.5 U	0.5 U	0.5 U	0.5 U	3.8 J	4.8 J	3.1 J	2.2 J	6.3	4.6 J
BENZO(A)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.051 J	0.06 J	0.28 J	1.3 J	1.2 J	10 U	0.92 J	0.72 J
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	1 J	10 U	10 U	5 U	5 U
BENZO(B)FLUORANTHENE	NC	1.5	ID	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U	5 U	5 U
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.1 J	0.5 U	0.05 J	12 U	10 U	10 U	0.41 J	5 U
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.041 J	0.5 U	0.1 J	12 U	10 U	10 U	5 U	5 U
DIBENZO(A,H)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U	5 U	5 U
FLUORANTHENE	NC	210	1.6	210	0.5 U	0.5 U	0.5 U	0.5 U	0.52 J	1.5 J	1 J	0.81 J	0.92 J	0.82 J
FLUORENE	NC	880	12	880	0.5 U	0.5 U	0.5 U	0.5 U	3.5 J	13	24	19	21	21
INDENO(1,2,3-CD)PYRENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U	5 U	5 U
NAPHTHALENE	NC	520	11	520	0.5 U	0.5 U	0.5 U	0.04 J	120	170	170	130	180	180
PHENANTHRENE	NC	52	2	52	0.5 U	0.5 U	0.5 U	0.5 U	8.8 J	11 J	11	8.3 J	12	12
PYRENE	NC	140	ID	140	0.5 U	0.5 U	0.5 U	0.5 U	0.39 J	1.5 J	1 J	10 U	0.92 J	0.82 J

TABLE 3-4

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR MARCH 2012 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	DAMW03						DAMW04			
SAMPLE DATE					6/6/2011	6/6/2011-D	9/14/2011	9/14/2011-D	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	3/6/2012
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)														
ARSENIC	10	10	10	10	2.7 J	2.7 J	4.3 J	4.1 J	1.3 J	0.71 J	3 J	3.6 J	1.2 J	0.84 J
BARIUM	2000	2000	670	2000	310 J	300 J	370	360	310	270	150 J	210	130	130
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.19 J
CHROMIUM	100	100	100	100	0.21 J	1 U	0.22 J	0.23 J	1 U	1 U	1 U	1 U	0.23 J	1 U
COPPER	1300	1000	13	1300	1 U	1 U	1 U	0.15 J	0.25 J	1 U	0.88 J	0.6 J	0.32 J	1 U
LEAD	15	2	14	15	1 U	1 U	1 U	1 U	1 U	1 UJ	0.44 J	0.45 J	0.17 J	2.8 J
SELENIUM	50	50	5	50	5 UJ	5 UJ	0.97 J	0.96 J	5 U	5 U	5 UJ	5 UJ	5 U	0.73 J
ZINC	NC	2400	170	2400	4.2 J	3.9 J	5.5	5 U	7.7 U	10 U	110	100	100	140
TOTAL METALS (UG/L)														
ARSENIC	10	10	10	10	2.6 J	2.5 J	4.8 J	4.4 J	1.3 J	0.75 J	3 J	3.8 J	1.1 J	0.87 J
BARIUM	2000	2000	670	2000	290	290	370	340	300	270	150	210	130	130
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.37 U	1.1 J	0.051 J	0.2 U	0.2 U	0.2 U	0.091 J	0.25
CHROMIUM	100	100	100	100	0.29 J	0.27 J	0.24 J	0.24 J	0.22 J	1 U	0.36 J	1 U	1 U	1 U
COPPER	1300	1000	13	1300	0.77 J	1 U	0.3 J	0.37 J	0.39 J	1 U	2.6	1.8	0.64 J	1 U
LEAD	15	2	14	15	0.47 J	0.33 J	0.7 J	0.57 J	1.2	0.18 J	2.1	3.3	1.8	2.8
SELENIUM	50	50	5	50	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 U	5 UJ	5 UJ	5 U	0.79 J
ZINC	NC	2400	170	2400	8.5 J	4.6 J	10	8.4	8.4	2 J	110 J	120	110	150
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)														
2-METHYLNAPHTHALENE	NC	260	19	260	0.07 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACENAPHTHENE	NC	1300	38	1300	1.6	1.6	2.6	2.9	1.5	1.6	0.05 J	0.03 J	0.5 U	0.5 U
ACENAPHTHYLENE	NC	52	ID	52	0.05 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ANTHRACENE	NC	43	ID	43	0.22 J	0.19 J	0.23 J	0.23 J	0.092 J	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(A)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.072 J	0.051 J	0.041 J	0.051 J	0.5 U	0.5 U	0.19 J	0.5 U
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.052 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.24 J	0.5 U
BENZO(B)FLUORANTHENE	NC	1.5	ID	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J	0.5 U
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.082 J	0.5 U	0.5 U	0.27 J	0.5 U
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J	0.5 U
DIBENZO(A,H)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.5 U
FLUORANTHENE	NC	210	1.6	210	0.2 J	0.15 J	0.27 J	0.23 J	0.11 J	0.11 J	0.5 U	0.5 U	0.04 J	0.5 U
FLUORENE	NC	880	12	880	0.36 J	0.27 J	0.19 J	0.28 J	0.13 J	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U
INDENO(1,2,3-CD)PYRENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.5 U	0.5 U	0.14 J	0.5 U
NAPHTHALENE	NC	520	11	520	0.19 J	0.11 J	0.062 J	0.5 U	0.5 U	0.5 U	0.05 J	0.5 U	0.5 U	0.5 U
PHENANTHRENE	NC	52	2	52	1.2	1	1.4	1.5	0.6	0.67	0.05 J	0.5 U	0.5 U	0.5 U
PYRENE	NC	140	ID	140	0.15 J	0.13 J	0.23 J	0.24 J	0.1 J	0.082 J	0.04 J	0.5 U	0.061 J	0.5 U

1 - For comparison only.
J - Estimated Concentration.
U - Below detection limit at detection limit shown.
D - Duplicate sample
Shaded cell indicates concentration greater than selected criterion.
bgs - Below ground surface.
GSI - Groundwater-surface water interface
ID - Insufficient data to develop criterion.
MCL - Maximum Contaminant Level.
NC - No criterion.
RBSL - Risk-Based Screening Level

TABLE 3-5

DESCRIPTIVE STATISTICS FOR GROUNDWATER
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Parameter	Frequency of Detection	Minimum Detected Concentration	Maximum Detected Concentration	Range of Non-Detects	Sample with Maximum Detection
Inorganics (ug/L)					
Arsenic	4/4	1.5	6.2	-	DA-GW-02-062011
Barium	4/4	150	290	-	DA-GW-03-062011
Barium	4/4	150	290	-	DA-GW-03-062011-D
Chromium	4/4	0.27	0.36	-	DA-GW-04-062011
Copper	4/4	0.74	2.6	1	DA-GW-04-062011
Lead	4/4	0.33	2.1	-	DA-GW-04-062011
Selenium	1/4	1	1	5	DA-GW-02-062011
Zinc	4/4	3.9	110	-	DA-GW-04-062011
Inorganics, Filtered (ug/L)					
Arsenic, Filtered	4/4	0.95	3	-	DA-GW-04-062011
Barium, Filtered	4/4	150	310	-	DA-GW-03-062011
Chromium, Filtered	3/4	0.21	0.47	1	DA-GW-02-062011
Copper, Filtered	3/4	0.42	0.88	1	DA-GW-04-062011
Lead, Filtered	3/4	0.17	0.44	1	DA-GW-04-062011
Zinc, Filtered	3/4	3.9	110	5	DA-GW-04-062011
PAHs (ug/L)					
2-Methylnaphthalene	2/4	0.07	24	0.5	DA-GW-02-062011
Acenaphthene	3/4	0.05	6	0.5	DA-GW-02-062011
Acenaphthylene	2/4	0.05	1.7	0.5	DA-GW-02-062011
Anthracene	2/4	0.19	3.8	0.5	DA-GW-02-062011
Benzo(a)anthracene	1/4	0.28	0.28	0.5	DA-GW-02-062011
Benzo(k)fluoranthene	1/4	0.05	0.05	0.5	DA-GW-02-062011
Chrysene	1/4	0.1	0.1	0.5	DA-GW-02-062011
Fluoranthene	2/4	0.15	0.52	0.5	DA-GW-02-062011
Fluorene	2/4	0.27	3.5	0.5	DA-GW-02-062011
Naphthalene	3/4	0.05	120	0.5	DA-GW-02-062011
Phenanthrene	3/4	0.05	8.8	0.5	DA-GW-02-062011
Pyrene	3/4	0.04	0.39	0.5	DA-GW-02-062011

Statistics are for first round of samples (June 2011) only.
Associated Samples:
DA-GW-01-062011,NORMAL
DA-GW-02-062011,NORMAL
DA-GW-03-062011,DUP
DA-GW-03-062011-AVG,AVG
DA-GW-03-062011-D,DUP
DA-GW-04-062011,NORMAL

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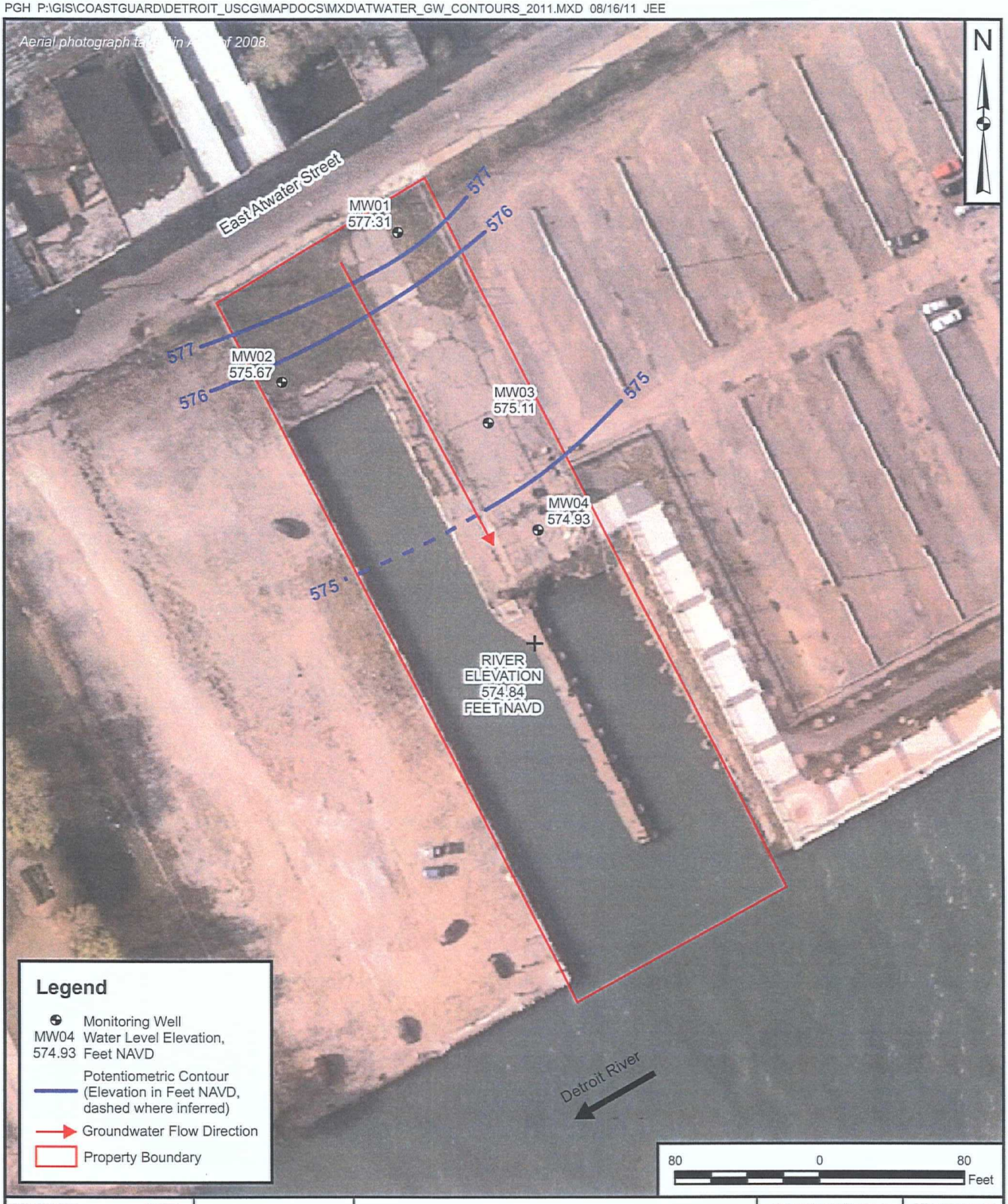

DRAWN BY J. ENGLISH	DATE 08/09/11	GROUNDWATER POTENTIOMETRIC SURFACE MAP USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER 02435	CTO NUMBER ___
CHECKED BY S. HILL	DATE 08/16/11		APPROVED BY ___	DATE ___
REVISED BY	DATE		APPROVED BY ___	DATE ___
SCALE AS NOTED			FIGURE NO. 3 - 1	REV 0

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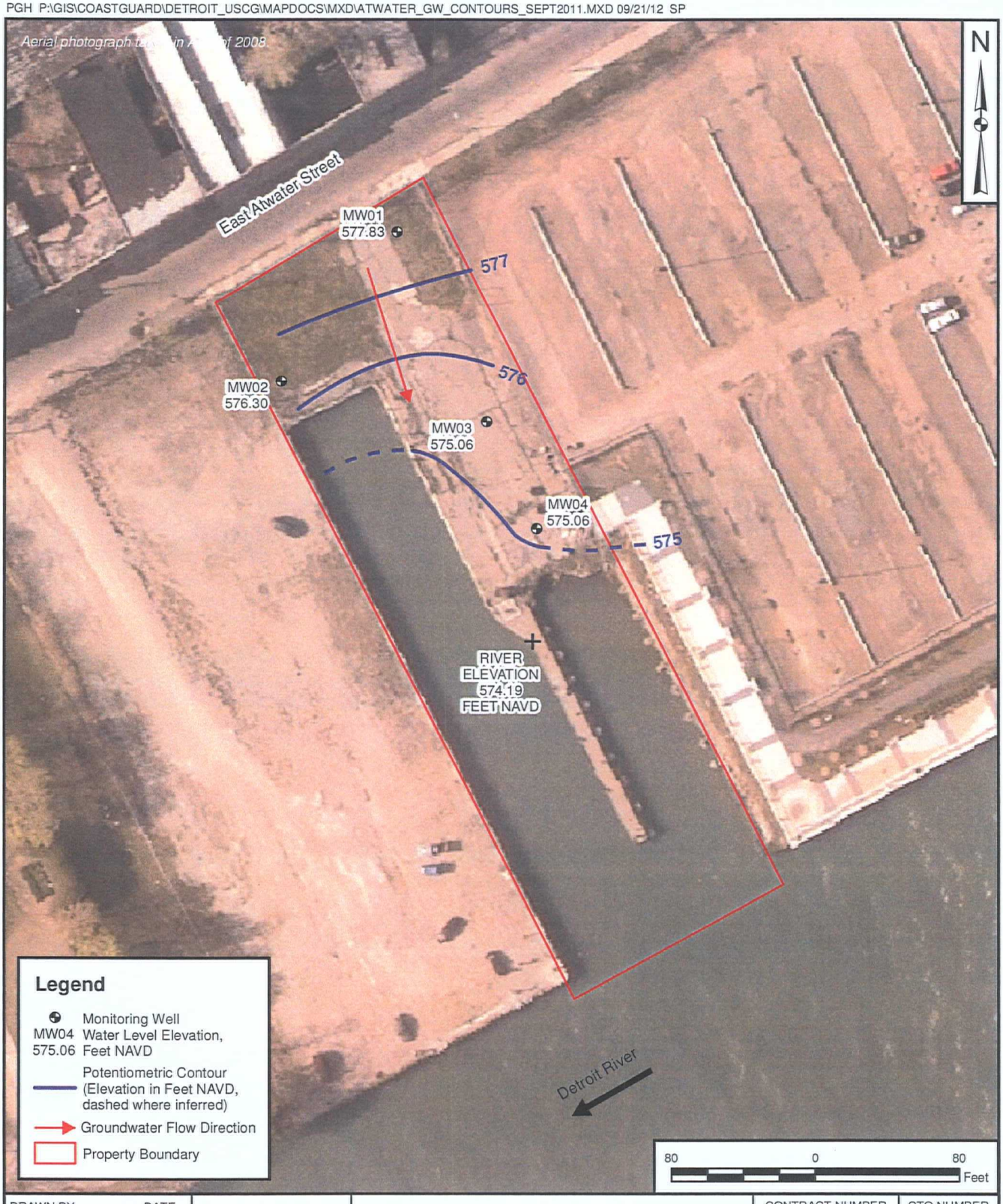

DRAWN BY	DATE		GROUNDWATER POTENTIOMETRIC SURFACE MAP (9/14/2011) USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER	CTO NUMBER
J. ENGLISH	09/21/12			02435	—
CHECKED BY	DATE			APPROVED BY	DATE
C. WARINO	09/21/12			—	—
REVISED BY	DATE			APPROVED BY	DATE
				—	—
SCALE AS NOTED				FIGURE NO. 3 - 2	REV 0

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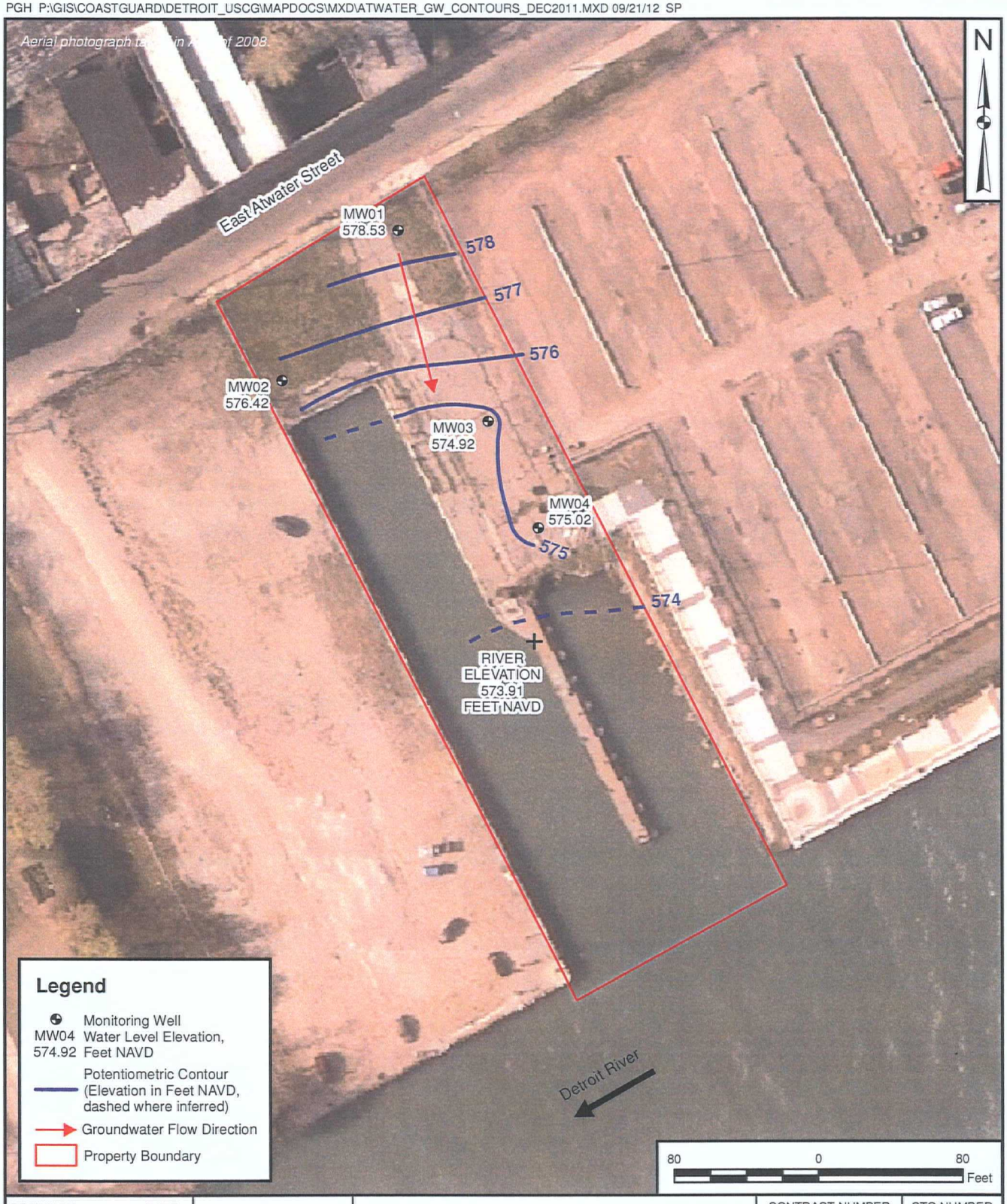

DRAWN BY	DATE		GROUNDWATER POTENTIOMETRIC SURFACE MAP (12/16/2011) USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER	CTO NUMBER
J. ENGLISH	09/20/12			02435	—
CHECKED BY	DATE			APPROVED BY	DATE
C. WARINO	09/20/12			—	—
REVISED BY	DATE			APPROVED BY	DATE
				—	—
SCALE AS NOTED				FIGURE NO. 3 - 3	REV 0

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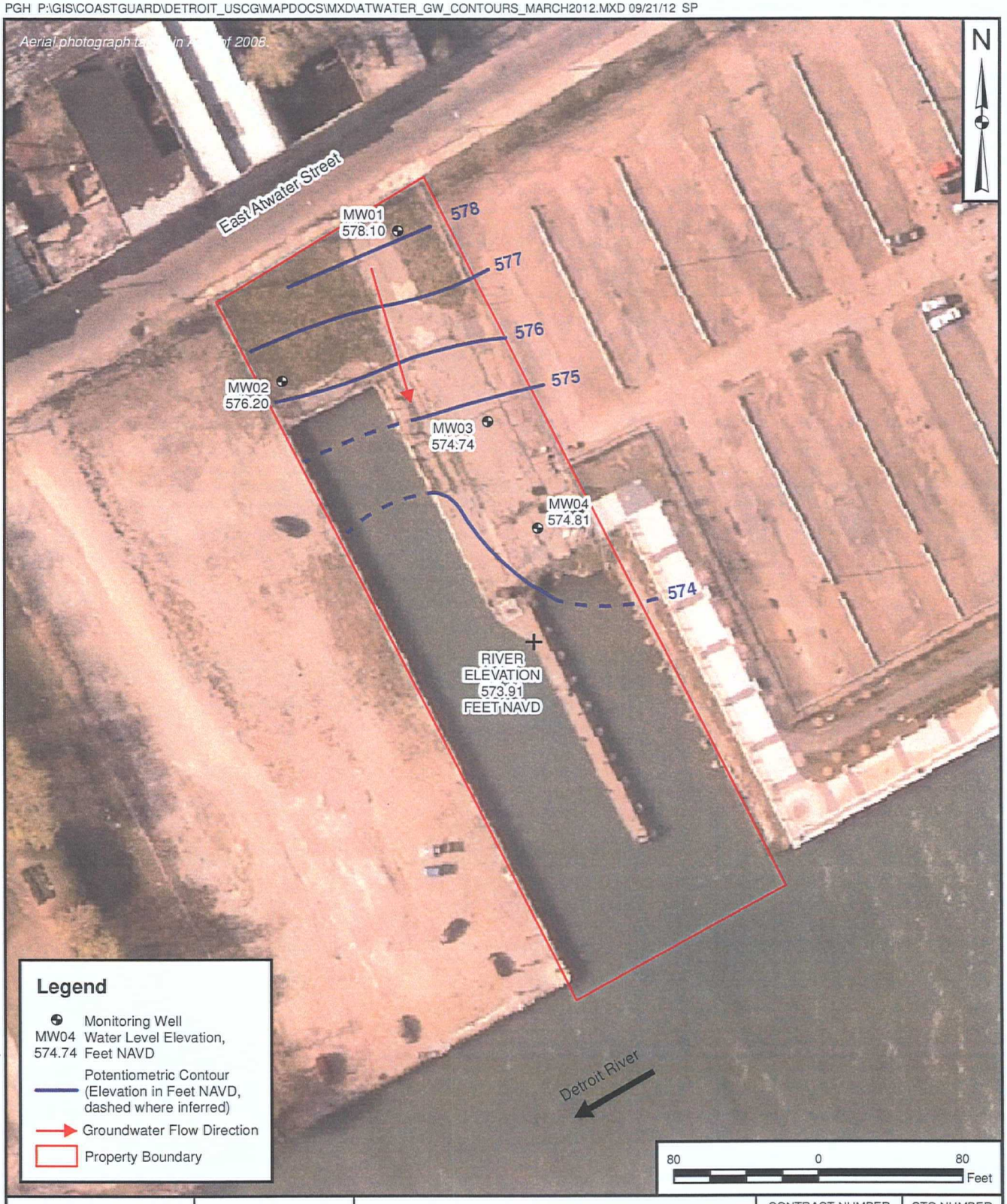


DRAWN BY: J. ENGLISH	DATE: 09/20/12
CHECKED BY: C. WARINO	DATE: 09/20/12
REVISED BY	DATE
SCALE: AS NOTED	

GROUNDWATER POTENTIOMETRIC SURFACE MAP (3/6/2012)
USCG ATWATER
DETROIT, MICHIGAN

CONTRACT NUMBER: 02435	CTO NUMBER: ___
APPROVED BY: ___	DATE: ___
APPROVED BY: ___	DATE: ___
FIGURE NO.: 3 - 4	REV: 0

4.0 COMPARISON OF DATA TO CRITERIA

4.1 HHRA SUMMARY AND CONCLUSIONS

USEPA defines the range of 1×10^{-4} to 1×10^{-6} as the ILCR target range for hazardous waste facilities addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). An ILCR of 1×10^{-6} indicates that the exposed receptor has an incremental one-in-one-million chance of developing cancer under the defined exposure scenario, and an ILCR of 1×10^{-4} indicates that the exposed receptor has an incremental one-in-ten-thousand chance of developing cancer under the defined exposure scenario. Individual or cumulative ILCRs greater than 1×10^{-4} are generally considered "unacceptable" by USEPA. Based on the USEPA risk management benchmarks of an incremental lifetime cancer risk (ILCR) of 1×10^{-4} (i.e., the upper end of the ILCR target range) and a hazard index (HI) equal to 1, the following COCs were identified.

Medium	Residential Exposure	Industrial Exposure
Surface Soil	Benzo(a)pyrene equivalents (BaPEq), Arsenic, Chromium VI[(1)]	None
Subsurface Soil	BaPEq [(2)], Arsenic[(2)], Chromium VI[(1)(2)]	None
Groundwater	Arsenic[(3)], Naphthalene, 2-Methylnaphthalene, BaPEq [(3)], Chromium VI[(1)(3)]	None

1 – It is unlikely that all chromium is present as hexavalent chromium. For example, assuming a one-to-six ratio of hexavalent chromium to trivalent chromium should be conservative for sites that are not considered to be hexavalent chromium sites. This is similar to methodology used to develop the USEPA air RSLs for hexavalent chromium, which were calculated using and the assumption of a one-to-six ratio of hexavalent chromium to trivalent chromium (USEPA, June 2011). Because available site history does not provide information about chromium speciation or use at the site, chromium was conservatively evaluated as hexavalent chromium. Total chromium would not be a COPC or a COC if using trivalent toxicity criteria instead of hexavalent toxicity criteria.

2 – No COCs are selected for residential exposure to chemicals in subsurface soil if using trivalent chromium toxicity criteria instead of hexavalent chromium toxicity criteria.

3 – The concentrations of arsenic and BaPEq in groundwater are less than the associated MCL; the concentrations of total chromium in groundwater are less than the MCL for total chromium.

Chromium VI = hexavalent chromium

The MDEQ target cancer risk level is 1×10^{-5}. In ILCR of 1×10^{-5} indicates that the exposed receptor has an incremental one-in-one-hundred-thousand chance of developing cancer under the defined exposure scenario. Based on the MDEQ risk management benchmarks of an ILCR of 1×10^{-5} and a HI equal to 1, the following COCs were identified.

Medium	Residential Exposure	Industrial Exposure
Surface Soil	BaPEq, Arsenic, Chromium VI[(1)]	BaPEq, Arsenic, Chromium VI[(1)]
Subsurface Soil	BaPEq, Arsenic, Chromium VI[(1)]	BaPEq[(2)], Arsenic[(2)], Chromium VI[(1)(2)]
Groundwater	Arsenic[(3)], Naphthalene, 2-Methylnaphthalene, BaPEq[(3)], Chromium VI[(1)(3)]	None

1 – It is unlikely that all chromium is present as hexavalent chromium. For example, assuming a one-to-six ratio of hexavalent chromium to trivalent chromium should be conservative for sites that are not considered to be hexavalent chromium sites. This is similar to methodology used to develop the USEPA air RSLs for hexavalent chromium, which were calculated using and the assumption of a one-to-six ratio of hexavalent chromium to trivalent chromium (USEPA, June 2011). Because available site history does not provide information about chromium speciation or use at the site, chromium was conservatively evaluated as hexavalent chromium. Total chromium would not be a COPC or a COC if using trivalent toxicity criteria instead of hexavalent toxicity criteria.
2 – No COCs are selected for industrial exposure to chemicals in subsurface soil if using trivalent chromium toxicity criteria instead of hexavalent chromium toxicity criteria.
3 – The concentrations of arsenic and BAP equivalents in groundwater are less than the associated MCL; the concentrations of total chromium in groundwater are less than the MCL for total chromium.
Chromium VI = hexavalent chromium

Guidance from the USEPA Office of Prevention, Pesticides, and Toxic Substances (OPPTS) and Office of Solid Waste and Emergency Response (OSWER) recommend 400 milligram per kilogram (mg/kg) as the screening level for lead impacted soil in a residential setting where children are frequently present (USEPA, 1994). To be conservative, 400 mg/kg was used as the screening level to select COPC for soil. However, guidance from the USEPA Technical Review Workgroup for Lead indicates that "a reasonable screening level for soil lead at commercial/industrial (i.e., non-residential) sites is 800 mg/kg" for a typical non-contact intensive worker (2010c); 800 mg/kg is also the current USEPA RSL for soils, assuming an industrial land use scenario. Mean concentrations were used as exposure point concentrations for lead in accordance with USEPA guidance (1994, 2010b, and 2003a). Because the risk for lead is determined using the EPA Integrated Exposure Uptake Biokinetic Model and Technical Review Workgroup Adult Lead Model using the arithmetic mean of the lead concentrations, the mean lead concentrations calculated for surface soil and subsurface soil were compared to the conservative screening level of 400 mg/kg to determine if further evaluation would be necessary. The mean lead concentrations for both surface soil and subsurface soil were lower than the 400 mg/kg threshold used by the models; therefore, lead was not identified as a COC in the HHRA.

4.2 SOIL RESULTS COMPARED TO CRITERIA

Several metals and PAHs were detected in the soil samples. Based on discussions between MDEQ and the City of Detroit, it is assumed that the site will have to meet MDEQ residential exposure criteria, but not MDEQ groundwater-surface water interface or protection of drinking water criteria. Only benzo(a)pyrene, arsenic, and lead are present at concentrations greater than MDEQ risk-based screening levels (RBSLs)

for residential exposure. Only lead is present at a concentration greater than the MDEQ RBSL for industrial exposure. The samples where the MDEQ residential and industrial criteria are exceeded are shown on Table 3-1 and are shown on Figure 4-1.

The 95-percent upper confidence limits (UCLs) were calculated for the HHRA. A comparison of these values to the MDEQ RBSLs is provided below.

Soil COC	UCL, µg/kg (Surface / Subsurface)	RBSL, µg/kg
Arsenic	10,000 / 10,400	7,600
Chromium VI[(1)]	15,800 / 15,900	2,500,000
BaPEq	2,000 / 1,600	2,000

1 – It is unlikely that chromium is present as hexavalent chromium. Total chromium would not be a COPC or a COC if using trivalent toxicity criteria instead of hexavalent toxicity criteria.
Chromium VI = hexavalent chromium

UCLs for chromium (evaluated as hexavalent chromium) and BaPEq are less than or equal to the RBSLs suggesting that no further action is required. However, because MDEQ uses ¼-acre areas for evaluating UCLs in residential scenarios, this will be considered further during the preparation of the Engineering Evaluation/Cost Analysis (EE/CA). UCLs for arsenic are greater than the RBSL, and a statistical approach can be used during the preparation of the EE/CA to determine the extent of soil to be remediated.

Note that no unacceptable residential risk was identified for lead, so it was not identified as a COC. However, the UCLs for lead (472 mg/kg in surface soil and 1,980 mg/kg in subsurface soil) are greater than the MDEQ RBSL, and remediation for lead may need to be considered so that concurrence from the MDEQ can be obtained.

4.3 GROUNDWATER RESULTS COMPARED TO CRITERIA

Although a few PAHs and metals were identified as COCs, most concentrations were less than the maximum contaminant levels (MCLs), or where MCLs were not available, less than MDEQ RBSLs (See Table 3-4). Although contaminant concentrations in groundwater samples collected during the SI were found to be less than MCLs and MEDEQ RBSLs, concentrations of some contaminants in samples collected during the quarterly monitoring were found to be greater than MCLs and/or MDEQ RBSLs.

In MW02, the total arsenic concentration was slightly greater than the MCL for two events, and the dissolved arsenic concentration was slightly greater than the MCL for one event. In addition, the

benzo(a)pyrene concentration was greater than the MCL for one event. For the other two events, benzo(a)pyrene concentrations could not be compared to the MCL because high concentrations of other hydrocarbons required sample dilution which raised the minimum detection limit above the MCL.

In MW04, the benzo(a)pyrene concentration was greater than the MCL during one event. In the other two sampling events, benzo(a)pyrene was not detected and the minimum detection limits were less than the MCL.

As noted, the concentrations of arsenic and benzo(a)pyrene were variable and only slightly greater than their respective MCLs. In addition, the shallow aquifer is an unlikely drinking water source. Detroit requires connection to the city water supply and does not allow private potable wells. Therefore, no groundwater remediation will be proposed for this low level of contamination.

4.4 COMPARISON OF SOIL RESULTS TO GROUNDWATER RESULTS

The groundwater results were compared to the results of nearby soil samples to evaluate the potential for migration of contaminants in the soil to groundwater. The following groundwater and soil sample locations were compared:

MW01 and SB105
MW02 and SB102
MW03 and SB110
MW04 and SB114 and EMSB14

Because of the low concentrations of contaminants in the groundwater, few contaminants can be compared. The following table summarizes the comparison. U indicates results less than the detection limit, and J indicates estimated concentrations.

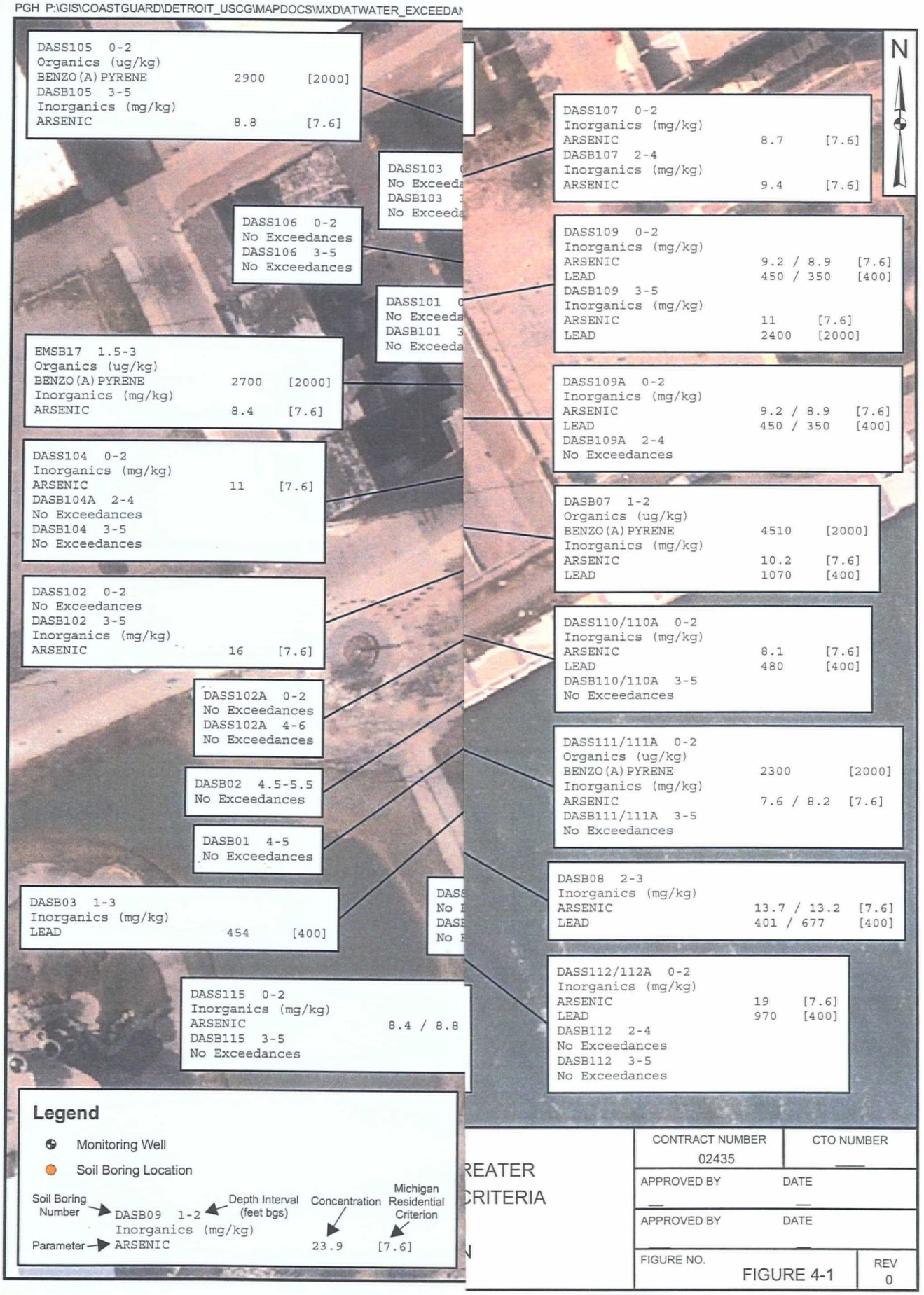
Contaminant	Well No. and Results, µg/L	Soil Sample Location and Results, µg/kg		Soil Sample Location and Results, µg/kg	
	MW01	SB105, Shallow	SB105, Deep		
2-Methylnaphthalene	0.5 U	4,300	27 J		
Naphthalene	0.5 U - 0.04 J	4,300	27 J		

Contaminant	Well No. and Results, µg/L	Soil Sample Location and Results, µg/kg		Soil Sample Location and Results, µg/kg	
	MW02	**SB102, Shallow**	**SB102, Deep**		
2-Methylnaphthalene	24 J - 50	270	1,800		
Naphthalene	120 - 180	200	1,700		
	MW03	**SB110, Shallow**	**SB110, Deep**		
2-Methylnaphthalene	0.5 U - 0.07 J	19 J	2.8 J		
Naphthalene	0.5 U - 0.19 J	23 J	2 J		
	MW04	**SB114, Shallow**	**SB114, Deep**	**EMSB14, Shallow**	**EMSB14, Deep**
2-Methylnaphthalene	0.5 U	360 U	69 J	NA	380
Naphthalene	0.5 U - 0.05 J	34 J	45 J	NA	210 J
Zinc	110 - 140	210	230	NA	330 J

The elevated concentrations of 2-methylnaphthalene and naphthalene in the groundwater sample from MW02 suggest that the relatively high concentrations of both compounds in samples from SB105 may be affecting the groundwater at this location. On the other hand, the relatively high concentrations of contaminants in the soil samples (SB105) near MW01 do not appear to have any effect on the groundwater concentrations. At the other two wells (MW03 and MW04), the concentrations of 2-methylnaphthalene and naphthalene in the groundwater samples are less than the detection limits, but the concentrations in nearby soil samples are also very low.

Based on the results of the soil samples near MW01, the soil contamination does not appear to be affecting the groundwater quality. However, although the 2-methylnaphthalene and naphthalene concentrations in MW02 are elevated, it is uncertain whether the groundwater is being affected by contaminants in the soil or by contaminants in the saturated zone. Because of the limited number of groundwater-soil sample pairs available for comparison, a strong conclusion cannot be made. However, based on the results of the samples near MW01, it appears that surface soil contamination does not affect groundwater.

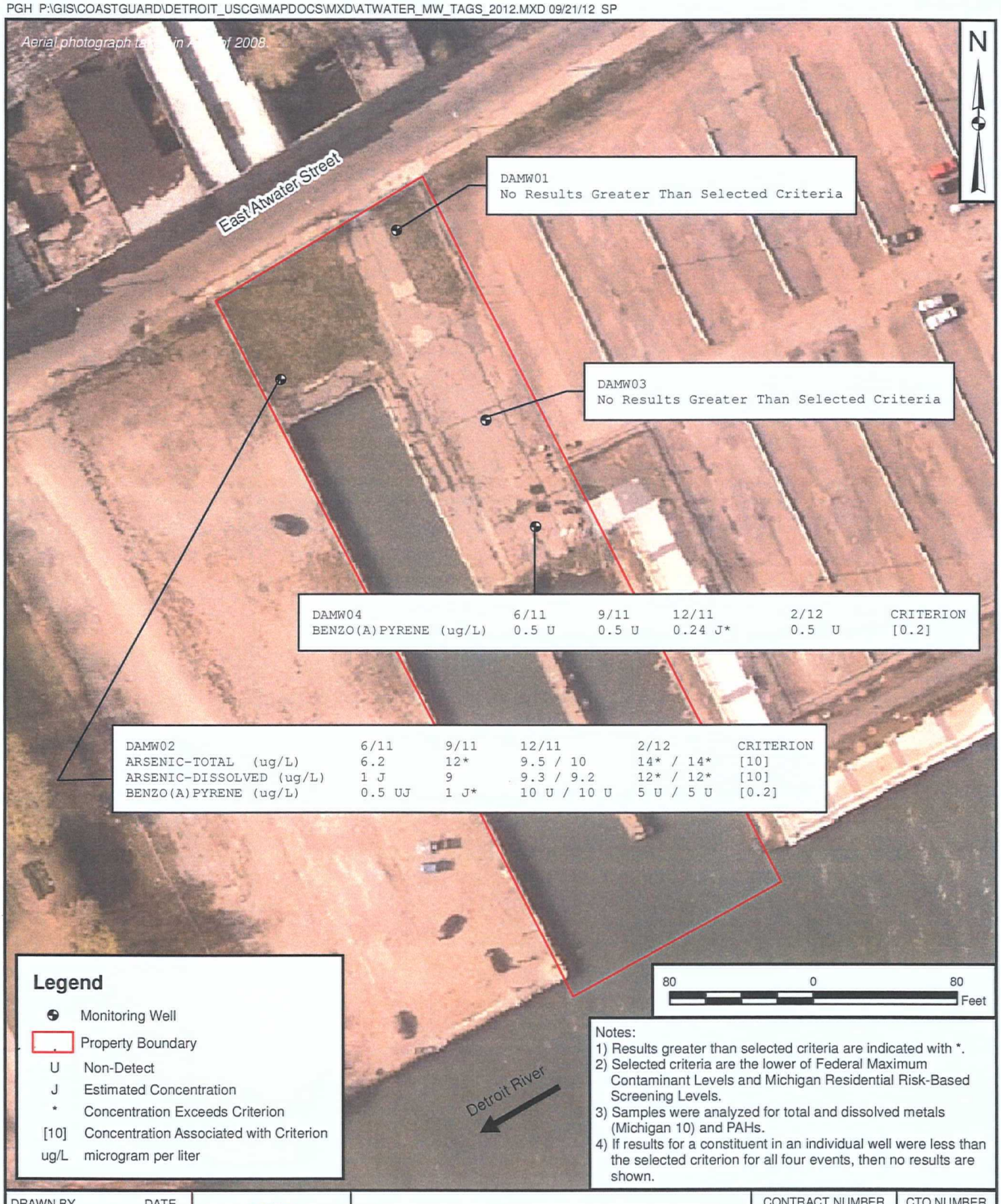
PGH P:\GIS\COASTGUARD\DETROIT_USCG\MAPDOCS\MXD\ATWATER_EXCEEDA



REATER
CRITERIA

CONTRACT NUMBER	CTO NUMBER
02435	—
APPROVED BY	DATE
—	—
APPROVED BY	DATE
	—
FIGURE NO. FIGURE 4-1	REV 0

PGH P:\GIS\COASTGUARD\DETROIT_USCG\MAPDOCS\MXD\ATWATER_MW_TAGS_2012.MXD 09/21/12 SP



DRAWN BY	DATE
S. PAXTON	09/21/12
CHECKED BY	DATE
J. LOGAN	09/21/12
REVISED BY	DATE
SCALE AS NOTED	

GROUNDWATER SAMPLE EXCEEDANCES
USCG ATWATER
DETROIT, MICHIGAN

CONTRACT NUMBER	CTO NUMBER
02435	—
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO. 4 - 2	REV 0

5.0 CONCLUSIONS

Based on the results of the SI, the following conclusions can be made:

- Generally, the fill material is within a bed of sand and/or clay and the fill material increases toward the southern portion of the site (the river). Typically, the first 1 to 3 feet of subsurface soil was fill material that was noted to be primarily sand and silt with trace amounts of coal, brick, weathered wood, glass, cinder, and clinker. Below the sand layer subsurface soil was noted to mostly consist of clay with interbedded layers of sand, gravel, and silt. Groundwater flow direction at the site is to the south toward the river.

- Based on the soil sample results for benzo(a)pyrene, arsenic, and lead, and HHRA, soil remediation will be required to meet residential use criteria. The depth of contamination varies from 2 feet to the top of the water table, approximately 5 feet. The estimated area of contaminated soil is 8,400 square feet, and the estimated volume of contaminated soil is 1,300 cubic yards.

- Although the HHRA shows a human health risk based on BaPEq in groundwater, the concentration of each PAH is less than the MCL or MDEQ RBSL. Groundwater remediation is not required, however, land use controls may be needed to address the exposure risk associated with the groundwater.

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TtNUS, 2010b. Quality Assurance Project Plan. USCG Atwater Facility. March.

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TtNUS, 2011b. Quality Assurance Project Plan Addendum. USCG Atwater Facility. April.

A

APPENDIX A

FIELD DOCUMENTATION

A-1 FIELD NOTES

A-2 BORING LOGS – 2010

A-3 RESAMPLE BORING LOGS – 2011

A-4 SOIL SAMPLING LOGS – 2010

A-5 SOIL RESAMPLE LOGS – 2011

A-6 MONITORING WELL CONSTRUCTION DIAGRAMS AND BORING LOGS

A-7 WELL DEVELOPMENT LOGS

A-8 GROUNDWATER SAMPLE LOGS

A-9 WATER LEVEL MEASUREMENTS

A-10 CHAIN OF CUSTODY FORMS – 2010

A-11 CHAIN OF CUSTODY FORMS – 2011

A-12 CALIBRATION LOG

A-13 SITE PHOTOGRAPHS

APPENDIX A-1

FIELD NOTES

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...for outdoor writing people."

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No. 391

YL-181

USCG Atwater
112G02435

0800 S. Hill meets w/ S. Mason at USCG facility on Mt. Elliot Street to obtain access to the site.
0830 met Trimatrix personel onsite to receive same coolers.
0900 TBE onsite to conduct utility mark outs.
S. Hill marks sample locations.
Note: Site is not secure, hole in fense, and open gate on the western side of the property.
3. Mason is aware and asked 1 fisherman to leave.
1400 TBE completes utility survey and pack up to drive to Lansing. All known and unknown utilities marked and basic sketch given to TNUS.
1430 all offsite.

4/19/20

0830 S. Hill onsite drillers exp
Soana. Will wait in car unt
arrive.
0845 EPA Owen Thompson
Mike Christianson onsite
0900 Chris White from TT
onsite begin - set up dram
H&S briefing and HASP S
off
1000 Begin Soil Borings - sta
with deep borings.
Attempted to core at SB13
w 18" inches of concrete
moved location and c
again at both new
with no success - out of
will attempt additional
in the morning.
advanced 4 other borin
1100 offsite and to cod
guard facility to fill
water and park trail
overnight.

4/20/

1630 Meet at Coast Guard facility to pick up trailor
045 onsite - begin additional core attmps. Tried 2 more then moved to a grassy area for SB14 near center that advanced
1130 complete all soil boring continue packing/prepping samples for Currier
230 send samples off with Currier and complete site clean up.
1300 all offsite

5/23/11 95° CLOUDS/SW

E WIND

0800 ONSITE MEETING COAST GAURD PERSONNEL TO UNLOCK GATE. BEGIN MARKING OUT LOCATIONS.

0900 UTILITY LOCATING SUBCONTRACTOR ONSITE, BEGINS CLEARING LOCATIONS.

0915 COMCAST, DTE, & ATT HAVE NO UTILITIES.

1230 UTILITIES LOCATED, ALL LOCATIONS CLEAR.

1300 OFFSITE.

CW

5/24/11 END

5/24/11 70° SUN

- SUPPLIES NEEDED FOR DRILLING ACTIVITIES.
- CONTAINER BAGS
- TAPE

0800 ONSITE, WAITING FOR COAST GAURD TO UNLOCK GATE.

0830 DRILLERS ONSITE, REVIEWING H&S MATERIALS

0845 COAST GAURD UNLOCKING GATE, MOVING GEAR INTO SITE.

0915 SETTING UP ON MW04. OWEN FROM EPA IS ONSITE.

1130 FINISHED MW04, SET @ 13.0', 10' SCREEN. MOVING TO MW03.

1300 FINISHED MW03, SET @ 13.0', 10' SCREEN. MOVING TO MW02

1430 FINISHED MW02, SET @ 13.0', 10' SCREEN. MOVING TO MW01.

1600 FINISHED MW01 @ 13.0', 10' SCREEN. CLEANING UP SITE.

1630 OFFSITE

4 USCG ATWATER

5/25/11 70° rain

C WARING

0800 ONSITE, WAITING FOR TTL PERSONNEL. GAUGING WELLS.

WELL	DTW	DTB
MW01 -	3.55	13.10
MW 02 -	1.50	13.10
MW03 -	3.81	13.25
MW04 -	2.87	13.15

RIVER LEVEL - 4.71' - MARKED A NEW LOCATION ON CONCRETE PIER. → "DTR"

0845 TTL ONSITE, REVIEWING H&S MATERIAL. SETTING UP ON DAGB 102.

0920 BEGIN COLLECTING DPT SAMPLES & DEVELOPING WELLS SIMULTANEOUSLY. SEE LOG SHEETS FOR SAMPLE DETAILS.

1000 SECOND TTL PERSONNEL ARRIVES TO COMPLETE FLUSHMOUNT PADS.

1400 FINISHED DPT SAMPLING & DEVELOPING. FINISHING UP PADS, CLEANING UP, LOADING EQUIPMENT. 4 SOIL DRUMS, 3 WATER DRUMS, 1 EMPTY DRUM ONSITE.

1600 OFFSITE TO FEDEX.

USCG ATWATER

6/6/11 80° SUN

C. WARING; C. WERTZ

1130 ONSITE, CALIBRATING EQUIP, FILLING OUT H&S. FORMS.

1145 WATER LEVEL @ RIVER - 3.85'

1200 SETTING UP TO SAMPLE WELLS. LYNN MILLER FROM THE COAST GUARD ONSITE.

1230 SURVEYOR ONSITE. REVIEWING LOCATIONS TO BE SURVEYED. 4 WELLS, 8 BORINGS, AND 1 POINT ALONG RIVER.

1500 SURVEYOR FINISHED.

1530 FINISHED COLLECTING GROUNDWATER SAMPLES FROM MW01, MW02, MW03, & MW04.

DA-GW-FD-01 FROM MW05

MS/MSD FROM MW01

1600 PACKING UP EQUIPMENT, SECURING SITE.

1630 OFFSITE TO FED EX TO SHIP SAMPLES.

DRUM #08 CONTAINS ~20 gal OF PURGE H_2O

APPENDIX A-2

BORING LOGS – 2010

Tetra Tech NUS, Inc.

Page 1 of 1

BORING LOG

PROJECT NAME: Detroit- Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTE
DRILLING RIG: DPT

BORING No.: DASB101
DATE: 4/21/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			3'		loose	Brn	Silt + Clay	CL/ML	Grass on Top	0.0			
							little Sand + T-gravel		T-Coade Brick				
							↓						
					Stiff	Brn	CLAY	CL					
4-6			2'							0.0			
					soft	Gray	↓						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 0002 - 1105
0305 - 1110

Converted to Well: Yes _____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB02
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			2'		med stiff	Brn	Silty SAND	SM	Grass on top	0.0			
					med stiff	Brn	CLAY w/little gravel	CL					
							↓						
4-8			1.5'		med stiff	Brn	CLAY w/little gravel	CL	Fill	0.0			
					Soft	brn	Sandy Clay	CL/SC	Fill				
							↓						
					white/Gray		Gravel/concrete	GP	Fill				
							↓						
8-12			1'			Brn/Gray	CLAY w/Gravel	CL	Fill	0.0			
					Soft		w/little sand						
							small piece of weathered wood						
							↓						
12-15			1'		med stiff Gray/Brown		Silty CLAY	CL/ML					
							↓						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: TWL Placed in well overnight.
WL in AM = 4.05'

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DAS8103
DATE: 4/21/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0.4			2.5'			White	Crush concrete & Sand			0.0			
						Brn	Silty CLAY	CL	Trace coal frags				
							clay increases w/						
							depth sand @ 3.90						
4-26			1.5'			Lt. Brn	Sand	SP		0.0			
						Brn	Clay @ 4.5'	CL					
						Gray	@ 5'						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 0002 @ 1030
0308 @ 1035

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112G04935
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB104
DATE: 9/20/10
GEOLOGIST: S. Hull
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			4'			White	Concrete/Rubble			0.0			
						Brn	CLAY w/ trace	CL					
							Brick/Coal						
							↓						
4-6			2'				CLAY	CL		0.0			
							↓						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: _____

Converted to Well: Yes _____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Arsenal
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB105
DATE: 4/21/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			2'		Stiff	Brn	Silty CLAY	CL		0.0			
							clay increasing w/depth		Brick frags				
					soft		little gravel						
							↓						
4-6			1.5'			Brn	CLAY	CL		0.0			
					Med Dens	Brown	SAND w/little clay	SP	wet@5'				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 0002 @ 1010
0305 @ 1015

Converted to Well: Yes _____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page 1 of 1

PROJECT NAME: Detroit Arrivals
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB102e
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%) N/A	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil, Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			2.5'		Stiff	Brn	Silt w/ sand trace gravel	SM		0.0			
										0.0			
4-8					loose	Blk	gravelly SAND	SP	Staining	0.0			
					Stiff	Brn	CLAY	CL		0.0			
4-8			2.8'		Stiff	Brn/gray	CLAY			0.0			
					Soft					0.0			
										0.0			
										0.0			
										0.0			
8-12			2'										
12-16			3'		Stiff								

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: _____

Converted to Well: Yes _____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB107
DATE: 4/21/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			1.5'			Brn	SAND w/ little silt/clay	SP	grass top	0.0			
										0.0			
							~~Polverized concrete~~ SAND w/ little silt/clay	SP	clinker				
4-6			0				No recovery 3+ attempts						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 0602 MSMSD @ 0945
0204 @ 0950

Drilling Area Background (ppm): 0-0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

Page 1 of 1

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TT
DRILLING RIG: DPT

BORING No.: DASB108
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
DA			3'			Brn	Silty SAND	SM	Grass on top	0.0			
						Very Brn	SAND	SP					
							↓						
4-6			2'		Soft	Gray Brn	CLAY	CL		0.0			
							↓						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 0902 @ 1045
0905 @ 1055

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG:

BORING No.: DASB09
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			4'			Grey Brn	SAND & Gravel	SP/GP	subbase	0.0			
							↓						
						Blk/brn	SAND w/ little gravel	SP	Fill/Coal, glass				
						Gray Brn	Gravel & Sand	SP/GP	Ash, weathered wood				
4-6			25'				↓			0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: DASB09-0002 Collect Dup (03)

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Arrwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB140
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			3.7'			Brn	Concrete/Asphalt Gravelly SAND	SP	Fill material	0.0			
						Brn/Blk	Gravelly silty SAND	SP	Black = Staining possible	0.0			
							↓			1.0			
					Stiff	Gray/Brn	Sandy CLAY	CL/SC		0.4			
4-8			1.2'			Gray/Brn	CLAY w/ little Gravel	CL	Fill	0.0			
							Brick frags Throughout			0.0			
							↓			0.2			
							↓			0.1			
8-12			2'		Loose	Gray/Brn	~~Clayey~~ SAND	SC	Wet	0.0			
							↓			0.0			
					Stiff	Gray	CLAY w/ Brick frags	CL		0.0			
					Soft	Gray/Blk	Sandy CLAY	SC		0.0			
12-16			2.5'		Med stiff	Gray	CLAY w/ little Sand	CL		0.0			
							↓			0.0			
					Soft		↓		Slight odor	2.3			
										0.2			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit - Atwater
PROJECT NUMBER: 112G 02435
DRILLING COMPANY: TTL
DRILLING RIG: HSA

BORING No.: DASB 111
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. Winters

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
04			3.2'			Brn	SAND & gravel	SP	Brick frags	0.0			
						Blk/brn	SAND some gravel	SP	coal frags	0.0			
									weathered wood	0.0			
						Brn/Gray	CLAY	CL		0.0			
4-6			1'										

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: Dup collected @ 0002 (01)

Converted to Well: Yes _____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Atwater-Detroit
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: HSA

BORING No.: DASB162
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		NA											
D-0.5							concrete core						
0.5-4			1.5'		loose	Brn/Black	SAND w/little silt	SP	Possible fill material Brick frags	0.0			
							T-gravel			0.0			
										0.0			
4-8			1.2'		soft	Brn/Gray	CLAY	CL		0.0			
										0.0			
										0.0			
										0.0			
8-12			0.5'		soft	Brn	Gravel & Clay w/little sand	CL/GP	wet	0.3			
12-15			2'			Blk/Brn	SAND - some gravel	SP	WRT Smear on soil	1.5			
										0.0			
							Clay	CL		4.6			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks:

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: SASB114-0
DATE: 4/21/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0-4			2.5'		loose	Brn	SAND w/ some gravel	SP		0.1			
							↓			0.4			
					Med stiff	Dk Brn	Clayey SAND	SC	moist	4.5			
							↓			0.2			
4-6			1.5'			Brn/gray	CLAY	CL					
							↓						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: 0002 @ 0910
0305 @ 0915

Drilling Area Background (ppm): 0.0

Converted to Well: Yes ____ No X Well I.D. #: ____

278 474 8139

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Detroit-Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB116
DATE: 4/20/10
GEOLOGIST: S. Hill
DRILLER: C. White

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
02			3.5'			Brn	Sand & Gravel	SP/GP	Fill	0.0			
						Brown/Black	SAND w/ little clay	SP	coal				
						Brn/Gray	CLAY	CL		0.0			
4-6			1'							0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: DASB116-0002 Duped (02)

Converted to Well: Yes _____ No X Well I.D. #: _____

APPENDIX A-3

RESAMPLE BORING LOGS – 2011

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB-102
DATE: 5/23/14
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
*	0.0-0.2'					BROWN	SILTY SANDY LOAM		MOIST	0.0			
	0.2-2.0'		3/4			BROWN	SILTY SANDY CLAY WITH GRAVEL / BRICK FRAGS		MOIST	0.0			
	2.0-4.0'					BROWN-GRAY	SILTY CLAY WITH SAND AND GRAVEL LAYERS MED PLASTICITY		MOIST	0.0			
*	4.0-10.0'		4/4			BROWN/GRAY	SILTY, SANDY CLAY, HIGH PLASTICITY, SOME GRAVEL AND SANDY LAYERS. SOME ASH/CEMENT MATERIAL.		WATER @ 6.0'	0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: SAMPLES COLLECTED @ 0'-2' (GRAB) 4'-6' 0925
MS/MSD ON [redacted] 0-2'
DUP SS, DUP SB

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: PASB-104
DATE: 5/28/11
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
*	0.0-0.5		3/4				CONCRETE		DRY/MOIST	0.0			
*	0.5-10.0					BROWN/GRAY	SILTY, SANDY, CLAY, SOME BRICK PIECES, SOME GRAVEL		WET @ 4'	0.0			
	6.0-8.0		4/4			GRAY	SILTY CLAY WITH SOME SAND AND ORGANIC MATTER,		FILL MATERIAL	0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: SAMPLED 0-2 @ 1100 2-4' @ 1105

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB 106
DATE: 5/25/11
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
*	0.0-0.2		3/4				SILTY, SANDY LOAM			0.0			
	0.2-2.0					BROWN	SILTY [redacted] F-L, SAND. SOME ORGANICS/CLAY		MOIST ASH, WOOD	0.0			
*	2.0-4.0		[redacted]			BROWN/GRAY	SILTY, SANDY CLAY, MED PLASTICITY, SOME GRAVEL.		WET @ 3.5'	0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: SAMPLED 0-2 @ 1310, 2-4 @ 1315

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: SB 109
DATE: 5/29/11
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0-0.2						ASPHALT & CONCRETE			0.0			
*	0.2-2.0		3.5/4			BRWN	GRAVEL & SAND, F-C GRAINED		MOIST	0.0			
*	2.0-4.0					GRAY	SILTY, CLAYEY SAND, ASH, & GRAVEL.			0.0			
									WET @ 4.0				

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: SAMPLES COLLECTED @ 0-2' & 2-4' @ 1115 @ 1120

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112G02435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB 11D
DATE: 5/25/11
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0-0.2						ASPHALT & CONCRETE						
*	0.2-1.0		3/4			BROWN	F-C SAND AND GRAVEL, SOME SILT		MOIST	0.0			
	1.0-4.0					GRAY	SILTY, SANDY, CLAY, WITH BRICK/ROCK FRAGS		ASH	0.0			
*	4.0-5.0		3/4			GRAY	SILTY CLAY WITH SOME F SAND.		WET @ 5.0'	0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: SAMPLED - 0-2' @ 1150, 3-5' @ 1155

Drilling Area Background (ppm): 0.0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DA-SB 111
DATE: 5/25/11
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0-0.25						ASPHALT						
*	0.25-2.0		3/4			BROWN	SILTY SAND & GRAVEL, SOME CLAY			0.0			
	2.0-4.8		3/4			LIGHT BLUE	SILTY, SANDY, CLAY WITH GRAVEL. BRICK FRAGS, ASH.		WOOD	0.0			
*	4.8-8.0		3/4			GRAY/BROWN	SILTY CLAY, MED PLASTICITY		WET @ 5.0'	0.2			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.2

Remarks: SAMPLED @ 0-2 @ 1220, 3'-5' @ 1225

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No. DASB-112
DATE: 5/25/14
GEOLOGIST: Charlie Warino
DRILLER: CHRIS WHITE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0-0.5						CONCRETE						
	0.5-3.0		3'5/4			BROWN/BLACK	F-L SAND WITH SILT AND GRAVEL		ASH, BRICK FRAGS	0.0			
	3.0-					GRAY	SILTY CLAY WITH SOME SAND & GRAVEL		WET @ 3.5' ORGANIC MATERIAL	0.0			
	4.0												

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: SAMPLED 0-2' 1340, 2-4 @ 1345

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER:
DRILLING COMPANY: TTL
DRILLING RIG: DPT

BORING No.: DASB115
DATE: 5/25/04
GEOLOGIST: Charlie Warino
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0-0.1						ASPHALT						
*	0.1-3.5'		3/4			BROWN (DARK)	F-L SAND & GRAVEL WITH SOME SILT.		ASPH	0.0			
*	3.5-4.0					GRAY	SILTY CLAY WITH SOME VF SAND AND GRAVEL		WET @ 3.5' ORGANIC MATERIAL	0.0			

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: SAMPLED 0-2' @ 1355 2'-4' @ 1400

Drilling Area Background (ppm): 0.0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

APPENDIX A-4

SOIL SAMPLING LOGS – 2010

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwatic
Project No.: 112G02435

Sample ID No.: DASB101-0002
Sample Location: SB101
Sampled By: S. Hill
C.O.C. No.: 133657

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10 Time: 1105 Method: DPT Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0'-2'	Brown	CL/ML

COMPOSITE SAMPLE DATA:

Date	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	yes	
metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Arsenal
Project No.: 112G02435

Sample ID No.: ~~DASB~~101-0305
Sample Location: SB101
Sampled By: S. Hill
C.O.C. No.: 133657

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 9/21/17	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1110	3'-5'	Brown	Clay
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112602435

Sample ID No.: DASB102-0002
Sample Location: SB102
Sampled By: S. Hill
C.O.C. No.: 133654

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10 Time: 1030 Method: DPT Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	Brown	SM/CL

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112902435

Sample ID No.: DASB102-0305
Sample Location: SB102
Sampled By: S. Hall
C.O.C. No.: 133654

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10
Time: 1146
Method: DPT
Monitor Reading (ppm): 0.0

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3'-5'	Brown	CL

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	yes	
Metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Arsenal
Project No.: 112G02436

Sample ID No.: DASB103-0002
Sample Location: SB103
Sampled By: S. Hill
C.O.C. No.: 133659

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10 Time: 1030 Method: DPT Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	White/Brown	Sand → (mostly) Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	Yes	
Metals	4oz	Yes	

OBSERVATIONS / NOTES:

Collected below concrete/subbase

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 126024.35

Sample ID No.: DASB103-0305
Sample Location: SB103
Sampled By: S. Hill
C.O.C. No.: 193659

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1035	3-5'	Brown to Light Brown	CL/SP
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	yes	
metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Arsenal
Project No.: 112802435

Sample ID No.: DASB104-0002
Sample Location: SB104
Sampled By: S. Hill
C.O.C. No.: 133655

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10 Time: 1645 Method: DPT Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	Brown	Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	yes	
metals	4oz	yes	

OBSERVATIONS / NOTES:

Collected below concrete/subbase

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB104-0305
Sample Location: SB104
Sampled By: S. Hill
C.O.C. No.: 133655

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1155	3-5'	Brown	Clay
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	yes	
Metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB105-0002
Sample Location: SB105
Sampled By: S. Hill
C.O.C. No.: 133059

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10 Time: 1010 Method: DPT Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	Brown	Silty Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	4	
Metals	4oz	4	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Airwater
Project No.: 112G02435

Sample ID No.: DASB105-0305
Sample Location: SB105
Sampled By: S. Hill
C.O.C. No.: 133659

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1015	3-5'	Brown	Clay
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	yes	
Metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NA	NA

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112602435

Sample ID No.: DASB106-0002
Sample Location: SB106
Sampled By: S. Hill
C.O.C. No.: 133654

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0955	0-2'	Brown	SM
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	Yes	
Metals	4oz	Yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB1016-0305
Sample Location: SB1016
Sampled By: S. Hill
C.O.C. No.: 133654

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1605	3-5	Black/Brown	Sand / Clay
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB107-0002
Sample Location: SB107
Sampled By: S. Hill
C.O.C. No.: 133659

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0945	0-2	Brown	Sand
Method: DPT			
Monitor Reading (ppm): 6.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	Yes	
metals	4oz	Yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB107-0204
Sample Location: SB107
Sampled By: S. Hill
C.O.C. No.: 133659

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0950	2-4	Brown	Sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	yes	
metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Aquifer
Project No.: 126G0435

Sample ID No.: DASB108-0002
Sample Location: SB108
Sampled By: S. Hill
C.O.C. No.: 135659

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10 Time: 1045 Method: Grab Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	Brown/ orange Brown	SM/SP

COMPOSITE SAMPLE DATA:

Date: / Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:			
Monitor Readings (Range in ppm):			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	yes	
Metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 1126 02435

Sample ID No.: DASB108-0305
Sample Location: DASB108
Sampled By: S. Hill
C.O.C. No.: 931659

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1055	3-5'	orange Brown/ Gray Brown	SP/CL
Method: Grab			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date: / Time:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:			
Monitor Readings (Range in ppm):			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.:

Sample ID No.: DASB109-0002
Sample Location: SB109
Sampled By: S. Hill
C.O.C. No.: 133655

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1625	0-2'	Gray Brown	SP/GP
Method: Grab			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	yes	
metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	DASBFD-03

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Aqueduct
Project No.: 1126 02435

Sample ID No.: DASB109-0305
Sample Location: DASB109
Sampled By: S. Hill
C.O.C. No.: 133605

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/30/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1635	3-5'	Black Brown/ Gray Brown	SP/GP
Method: Grab			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	Yes	
Metals	4oz	Yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB110-0002
Sample Location: SB10
Sampled By: S. Hill
C.O.C. No.: 133654

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1125	0-2'	Brown/Black	SP
Method: Grab			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAHs	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Riverfront
Project No.: 112G02435

Sample ID No.: DSB110-0805
Sample Location: SB110
Sampled By: S Hill
C.O.C. No.: 133694

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/28/10 Time: 1140 Method: Grab Monitor Reading (ppm): 1.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	3-5'	Gray	CL/SC

COMPOSITE SAMPLE DATA:

Date: / Method: / Monitor Readings (Range in ppm):	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Wastewater
Project No.: 129 02435

Sample ID No.: DASB 111-0002
Sample Location: SB111
Sampled By: S. Hill
C.O.C. No.: 133154

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10 Time: 1530 Method: Grab Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	Brown/Black	SP/SC

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	yes	
Metals	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	DASBFD-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112902435

Sample ID No.: DASB11-0305
Sample Location: SB11
Sampled By: S-Hill
C.O.C. No.: 133655

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10 Time: 1340 Method: Grab Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	B-5	Brown/GRY	CL

COMPOSITE SAMPLE DATA:

Date: / Time:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:			
Monitor Readings (Range in ppm):			

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

lab duplicate collected

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB112-0002
Sample Location: SB112
Sampled By: S. Hill
C.O.C. No.: 133165-4

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10 Time: 1455 Method: Grab Monitor Reading (ppm): 0.0	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0-2'	Brown Black	SP

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

Collected from first interval below Concrete/Subbase

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112503435

Sample ID No.: DASB112-0805
Sample Location: SB112
Sampled By: S. Hill
C.O.C. No.: 133654

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1455	3-5'	Brown/Black	SP/CL
Method: Grab		Brown/Gray	
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
~~PAH~~	4oz	yes	
~~Metals~~	4oz	yes	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB14-0002
Sample Location: SB14
Sampled By: S. Hill
C.O.C. No.: 133659

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0910	0-2'	Brown	SP
Method: Grab			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	Yes	
Metals	4oz	Yes	

OBSERVATIONS / NOTES:

Extra volume collected for laboratory Duplicates

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DASB114-0305
Sample Location: SB114
Sampled By: S. Hill
C.O.C. No.: 133659

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [x] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/21/10 Time: 0915 Method: Grab Monitor Reading (ppm): 4.5	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	3-5'	Dark Brown/Gray	SC/CL

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	YES	
metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02135

Sample ID No.: DASB115-0002
Sample Location: SB115
Sampled By: S. Hill
C.O.C. No.: 133655

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1600	0-2'	Brown Brown/Black	SP/GP
Method: Grab			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH	4oz	Yes	
Metals	4oz	Yes	

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:
N/A	DASBFD-02

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112902435

Sample ID No.: DSB115-0305
Sample Location: SB115
Sampled By: S. Hill
C.O.C. No.: 033655

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 4/20/10	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1610	3-5'	Brown/ Gray	CL
Method: Grab			
Monitor Reading (ppm): 6.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Part	4oz	YES	
Metals	4oz	YES	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
N/A	N/A

Signature(s):

APPENDIX A-5

SOIL RESAMPLE LOGS – 2011

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [ ] SEDIMENT
[X] SUBSURFACE SOIL [ ] LAGOON / POND
[ ] OTHER _____

SIGNATURE(S): [signature]

SAMPLER (S): CHARLIE WARWD

PROJECT NAME: USCG ATWATER
PROTECT NUMBER: 112602435

LOCATION: DASB-102

SAMPLE No.	SAMPLE METHOD	DEPTH (FT.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: PAH	ANALYSES: Hg	ANALYSES	ANALYSES	ANALYSES	ANALYSES	USCS	PID READING	SOIL DESCRIPTION
DA-SS-102-0002	DPT	0-2	5/25/1	0920	L	G	1	X	X						0.0	SILTY SANDY CLAY W/ GRAVEL & BRICK.
DA-SB-102-02/06	DPT	4-6	5/25/1	0925	L	G	1	X	X						0.0	SILTY SANDY CLAY. SOME GRAVEL & ASH.

REMARKS: DA-SS-FD-01 DUP 0002
DA-SB-FD-01 DUP 0406
MS/MSD ON 0002

LABORATORY: TRI MATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [ ] SEDIMENT
[X] SUBSURFACE SOIL [ ] LAGOON / POND
[ ] OTHER _____

SIGNATURE(S): [signature]

SAMPLER (S): CHARLIE WARING

PROJECT NAME: USCG ATWATER

PROTECT NUMBER: 112G02435

LOCATION: DA-SB-104

SAMPLE No.	SAMPLE METHOD	DEPTH (Ft.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: PAH	ANALYSES: Hg	ANALYSES:	ANALYSES:	ANALYSES:	ANALYSES:	USCS	PID READING	SOIL DESCRIPTION
DA-SS-104-0002	DPT	0-2	5/23/11	1100	L	G	1	X	X						0.0	SILTY SANDY CLAY, SOME BRICK & GRAVEL
DA-SB-104-0204	DPT	2-4	5/23/11	1105	L	G	1	X	X						0.0	SAA

REMARKS:

LABORATORY: TRIMATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[#] SURFACE SOIL [] SEDIMENT
[#] SUBSURFACE SOIL [] LAGOON / POND
[] OTHER _____

SIGNATURE(S): [signature]

SAMPLER (S): CHARLES WARNO

PROJECT NAME: USCG ATWATER
PROTECT NUMBER: 112G02435

LOCATION: DASB -106

SAMPLE No.	SAMPLE METHOD	DEPTH (Ft.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES						USCS	PID READING	SOIL DESCRIPTION
								TAL	MS							
DA-SS-106-0002	DPT	0-2	5/25/11	1310	L	G	1	X	X						0.0	SILTY SAND, SOME GRAVEL
DA-SB-106-0204	DPT	2-4	5/25/11	1315	L	G	1	X	X						0.0	SILTY SANDY CLAY, SOME GRAVEL

REMARKS:

LABORATORY: TRI MATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [ ] SEDIMENT
[X] SUBSURFACE SOIL [ ] LAGOON / POND
[ ] OTHER _____

SIGNATURE(S): [signature]

SAMPLER (S): CHARLIE WARREN

PROJECT NAME: USCG ATWATER

PROTECT NUMBER: 112G02435

LOCATION: DA SB 109

SAMPLE No.	SAMPLE METHOD	DEPTH (Ft.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: SVOC	ANALYSES: Hg	ANALYSES	ANALYSES	ANALYSES	ANALYSES	USCS	PID READING	SOIL DESCRIPTION
DA-SS-109-0002	DPT	0-2	5/29/14	1115	L	G	1	X	X						0.0	GRAVEL ? SAND
DA-SB-109-0204	DPT	2-4	5/29/14	1120	L	G	1	X	X						0.0	SILTY, CLAYEY, SAND, ASH, ? GRAVEL.

REMARKS:

LABORATORY: TRI MATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [] SEDIMENT
[] SUBSURFACE SOIL [] LAGOON / POND
[] OTHER _____

SIGNATURE(S): [signature]

SAMPLER (S): CHARLIE WINCHO

PROJECT NAME: USCG ATWATER
PROTECT NUMBER: 112602433

LOCATION: DA SB - 110

SAMPLE No.	SAMPLE METHOD	DEPTH (Ft.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: PAH	ANALYSES: Hg	ANALYSES	ANALYSES	ANALYSES	ANALYSES	USCS	PID READING	SOIL DESCRIPTION
DA-SS-110-0002	DPT	5/25/4	0-2	1150	L	G	1	X	X						0.0	SAND & GRAVEL, SOME SILT.
DA-SB-110-0305	DPT	5/25/4	3-5	1155	L	G	1	X	X						0.0	SILTY, SANDY, CLAY.

REMARKS:

LABORATORY: TRI MATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [] SEDIMENT
[X] SUBSURFACE SOIL [] LAGOON / POND
[] OTHER _____

SIGNATURE(S): _____

SAMPLER (S): CHARLES WATKINS

PROJECT NAME: USCG ATWATER

PROTECT NUMBER: 112602435

LOCATION: DA SB-111

SAMPLE No.	SAMPLE METHOD	DEPTH (Ft.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: PAH	ANALYSES: Hg	ANALYSES	ANALYSES	ANALYSES	ANALYSES	USCS	PID READING	SOIL DESCRIPTION
DA-SS-111-0002	DPT	0-2	5/25/04	1220	L	G	1	X	X						0.0	SILTY SAND AND GRAVEL, SOME CLAY.
DA-SB-111-0305	DPT	3-5	5/25/04	1225	L	G	1	X	X						0.0	SILTY SANDY CLAY, W/ GRAVEL

REMARKS:

LABORATORY: TRIMATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [] SEDIMENT
[X] SUBSURFACE SOIL [] LAGOON / POND
[] OTHER _____

SIGNATURE(S): [signature]

SAMPLER (S): CHARLIE WAREWD

PROJECT NAME: USCG ATWATER
PROTECT NUMBER: 112G02435

LOCATION: DA-SB-112

SAMPLE No.	SAMPLE METHOD	DEPTH (FL)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: PAH	ANALYSES: MS	ANALYSES	ANALYSES	ANALYSES	ANALYSES	USCS	PID READING	SOIL DESCRIPTION
DA-SS-112-0002	DPT	02	5/23/4	1840	L	G	1	X	X						0.0	SAND W/ SILT & GRAVEL
DA-SB-112-0204	DPT	2-4	5/23/4	1315	L	G	1	X	X						0.2	SILTY CLAY, SOME SAND & GRAVEL

REMARKS:

LABORATORY: TRI MATRIX

COC No.:

MULTIPLE SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

[X] SURFACE SOIL [ ] SEDIMENT
[X] SUBSURFACE SOIL [ ] LAGOON / POND
[ ] OTHER _____

SIGNATURE(S): _____

SAMPLER (S): CHARLIE VARNO

PROJECT NAME: USCG ATWATER
PROTECT NUMBER: 112602435

LOCATION: DA SB-115

SAMPLE No.	SAMPLE METHOD	DEPTH (Ft.)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	(G) GRAB (C) COMPOSITE	TOTAL No. OF CONTAINERS	ANALYSES: PAH	ANALYSES: Hg	ANALYSES	ANALYSES	ANALYSES	ANALYSES	USCS	PID READING	SOIL DESCRIPTION
DA-SS-115-0002	DPT	0-2	5/29/14	1355	L	G	1	X	X						0.0	SAND & GRAVEL, SOME SILT.
DA-SB-115-0204	DPT	2-4	5/29/14	1400	L	G	1	X	X						0.0	SILTY CLAY WITH SOME SAND & GRAVEL.

REMARKS:

LABORATORY: TRI MATRIX

COC No.:

APPENDIX A-6

MONITORING WELL CONSTRUCTION DIAGRAMS AND BORING LOGS

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112G02455
DRILLING COMPANY: TTL
DRILLING RIG: HSA

BORING No.: MW 01
DATE: 5/24/11
GEOLOGIST: Charlie Warino
DRILLER: CHARLIE MOORE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		3/4	24/24			BRN	0.0-0.2 SILTY CLAYEY LOAM. 0.2-2.0 SILTY						
	2.0'	6/7					CLAY, SOME VF-C SAND. 1/8" THICK SAND			0.0			
		5/16	14/24				LAYER @ 1.75'						
	4.0'	25/50/4				DK GRAY	2.0-4.0' SAND, VF-M GRAINED WITH SOME SILT, SOME UNCONSOLIDATED SHELL		WET @ 4.0'	0.0			
		50/3	0/24				NO RECOVERY						
	6.0'									0.0			
		0/0				DK GRAY	SILTY, SANDY, CLAY-MED PLASTICITY SOME GRAVEL AND ORGANIC MATERIAL		WET				
	8.0'	2/2								0.0			
		1/2											
	10.0'	3/5					SAA		WET	0.0			
		7/8											
	12.0'	12/15					SAA			0.0			
		6/14											
	14.0'	20/24								0.0			
							SAA						
							14.0' BGS E.O.B						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 2" WELL SET @ 13.0', 10' SCREEN, SAND TO 2' BGS, BENTONITE TO SURFACE

Converted to Well: Yes X No _____ Well I.D. #: MW01

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: HSA

BORING No.: MW 02
DATE: 5/24/11
GEOLOGIST: Charlie Warino
DRILLER: CHARLIE MOORE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
		1/2	14/24			BROWN	0.0'-0.25'- SILTY SANDY LOAM 0.25'-2.0' SILTY CLAY WITH			0.2			
	2.0'	2/2					VF-C SAND. SOME BRICK FRAGS.		MOIST	0.0			
		4/4	18/24			BROWN	SILTY, SANDY CLAY WITH SOME ROCK FRAGS.		MOIST				
	4.0'	5/4								0.0			
		11/7	10/24				SAA						
	6.0'	5/4								0.0			
		7/5	8/24				SAA		WET @ 6.0'				
	8.0'	5/5					COARSE SAND LENSES THROUGHOUT.			0.0			
		3/2	18/24			DK GRAY	SILTY CLAY. SOME VF-F SAND. HIGH PLASTICITY		MOIST				
	10.0'	1/2								0.0			
		3/4	20/24			DK GRAY TO GREEN	SAA						
	12.0'	4/5								0.0			
	13.0'	3/0	24/24				SAA						
	14.0'	10/12								0.0			
							E.O.B. 14' BGS.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 2" PVC WELL SET @ 13.0' BGS, 10' SCREEN, SAND TO 2' BGS, BENTONITE TO SURFACE

Converted to Well: Yes X No _____ Well I.D. #: MW 02

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: HSA

BORING No.: MW 03
DATE: 5/24/11
GEOLOGIST: Charlie Warino
DRILLER: CHARLIE MOORE

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0'-0.5'						ASPHALT						
	1.0'	12/12	4.5'			DK BROWN BLACK	SILTY SAND AND GRAVEL WITH BRICK & ROCK		MOIST	0.0			
	3.0'	10/7	18/24				FRAGMENTS.			0.0			
		6/7					SAA TO 4.5'						
	5.0'	6/8				GRAY BROWN	4.5'- SILTY CLAY WITH SOME VF-F SAND		MOIST	0.0			
		1/1	16/24			DK GRAY BLACK	SILTY, SANDY, CLAY WITH SAND LENSES AND						
	7.0'	0/2					BRICK FRAGMENTS HIGH PLASTICITY		WET @ 6.0'	0.0			
		2/4	12/24			BLACK	SAA		WET				
	9.0'	2/2								0.0			
		0/3	10/24			GRAY BROWN	SILTY CLAY. SOME SAND AND BRICK FRAG		WET				
	11.0'	0/3					IN SILTY LENSES.			0.0			
		0/1				GRAY BROWN	SILTY CLAY WITH SOME VF-F SAND. HIGH PLASTICITY		WET.				
	13.0'	0/1								0.0			
							E.O.B. 13' BGS						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: 2" PVC WELL SET @ 13' BGS. 10' SCREEN. SAND TO 2' BGS, BENTONITE TO SURFACE.

Converted to Well: Yes X No _____ Well I.D. #: MW 03

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: USCG Atwater
PROJECT NUMBER: 112602435
DRILLING COMPANY: TTL
DRILLING RIG: HSA

BORING No.: MW-04
DATE: 5/24/11
GEOLOGIST: Charlie Warino
DRILLER: Charlie Moore

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.0-0.1						ASPHALT						
	0.1-1.5						CONCRETE						
	1.5-3.5	1/1					NO RECOVERY TO			0.0			
		1/1	3"/24				3.25'. 3.25'-3.5' SILTY						
		[illegible]				BLACK/DK BROWN	SANDY CLAY						
	3.5'-	5/1	9"/24			BLACK	SILTY SANDY CLAY WITH						
	5.0'	1/1					WOOD CHUNK. THIN SAND		WET @ 5.0'	0.0			
							LAYERS THROUGHOUT.						
		2/2	18"/24			BLACK/DK BROWN	SILTY, SANDY CLAY WITH BRICK FRAGS AND		SAND LENSES ARE				
	7.0	1/6					SAND LENSES, HIGH PLASTICITY		SATURATED.	0.0			
		7/1	18"/24			BLACK	SILTY SANDY CLAY WITH						
	9.0	1/1					BRICK FRAG			0.0			
		1/1	20"/24			BROWN	SILTY CLAY, FAT, SOME SAND, HIGH PLASTICITY		WET				
	11.0	1/1					SAA			0.0			
		1/1	20"/24										
	13	1/1					SAA			0.0			
							13.0' EOB.						

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): 0.0

Remarks: MW 04 SET @ 13.0' BGS SAND TO 2'
10' SCREEN. BENTONITE TO SURFACE.
2" PVC RISER & SCREEN.

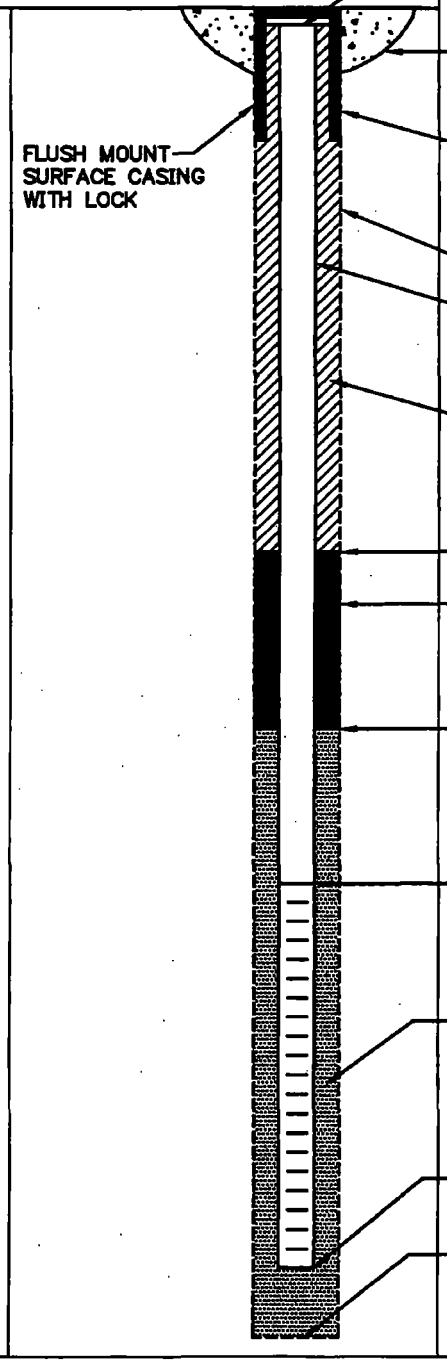
Converted to Well: Yes X No ___ Well I.D. #: MW 04

WELL NO.: MW 01

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT USCG ATWATER	LOCATION DETROIT, MI	DRILLER TTL - CHARLIE MOORE
PROJECT NO. 112G02435	BORING MW 01	DRILLING METHOD HSA
DATE BEGUN 5/24/11	DATE COMPLETED 5/25/11	
FIELD GEOLOGIST CHARLIE WARZYNSKI		DEVELOPMENT METHOD PUMP/SURGE
GROUND ELEVATION	DATUM	



ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: STEEL

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: CONCRETE

ELEVATION/DEPTH TOP OF SEAL: / 11'

TYPE OF SEAL: BENTONITE

ELEVATION/DEPTH TOP OF SAND: / 12.35

ELEVATION/DEPTH TOP OF SCREEN: / 13.35

TYPE OF SCREEN: 2" PVC

SLOT SIZE x LENGTH: 0.010" x 10'

TYPE OF SAND PACK: NO. 30-50

DIAMETER OF HOLE IN BEDROCK: 8"

ELEVATION / DEPTH BOTTOM OF SCREEN: / 13.35

ELEVATION / DEPTH BOTTOM OF SAND: / 13.35

ELEVATION/DEPTH BOTTOM OF HOLE: / 13.35

BACKFILL MATERIAL BELOW SAND: _____

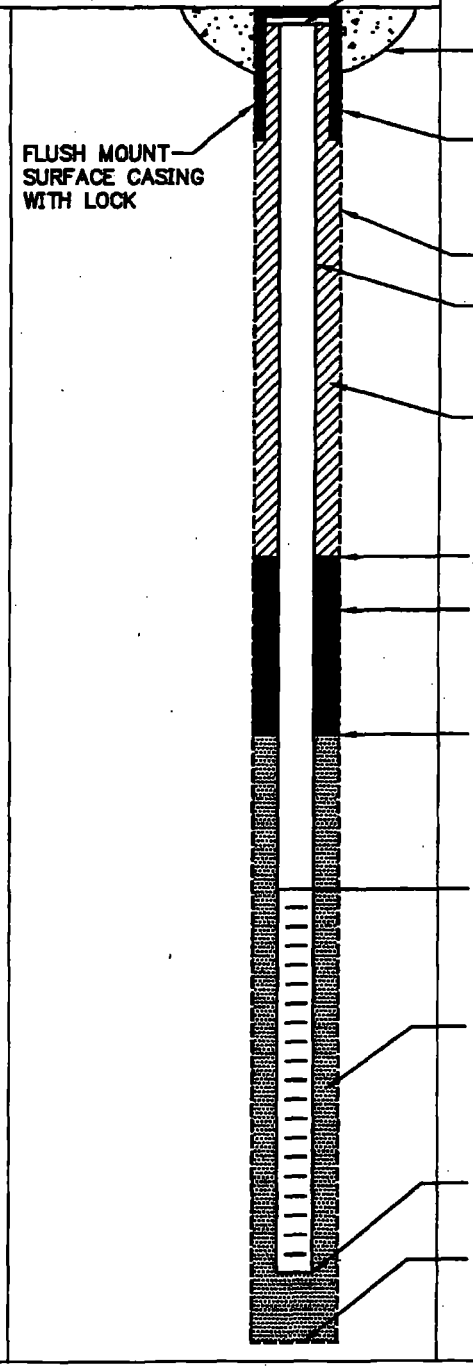
ACAD:FORM_MWFM.dwg 07/28/99 INL

WELL NO.: MW 02

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT: USLCI ATWATER	LOCATION: DETROIT, MI	DRILLER: TTL - CHARLIE MOORE
PROJECT NO.: 112GD2455	BORING: MW 02	DRILLING METHOD: HSA
DATE BEGUN: 5/24/11	DATE COMPLETED: 5/25/11	
FIELD GEOLOGIST: CHARLIE WARD		DEVELOPMENT METHOD: PUMP / SURGE
GROUND ELEVATION:	DATUM:	



ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: STEEL

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: CONCRETE

ELEVATION/DEPTH TOP OF SEAL: / 1

TYPE OF SEAL: BENTONITE

ELEVATION/DEPTH TOP OF SAND: / 2.35

ELEVATION/DEPTH TOP OF SCREEN: / 3.35

TYPE OF SCREEN: 2" PVC

SLOT SIZE x LENGTH: 0.010" x 10'

TYPE OF SAND PACK: NO. 30-50

DIAMETER OF HOLE IN BEDROCK: _____

ELEVATION / DEPTH BOTTOM OF SCREEN: / 13.35

ELEVATION / DEPTH BOTTOM OF SAND: / 13.35

ELEVATION/DEPTH BOTTOM OF HOLE: / 13.35

BACKFILL MATERIAL BELOW SAND: _____

ACAD:FORM_MWFM.dwg 07/20/99 INL

WELL NO.: MW03

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT USCG ATWATER	LOCATION DETROIT, MI	DRILLER TTL - CHARLIE MOORE
PROJECT NO. 112602435	BORING MW03	DRILLING METHOD HSA
DATE BEGUN 5/24/11	DATE COMPLETED 5/25/11	
FIELD GEOLOGIST CHARLIE WARING		DEVELOPMENT METHOD PUMP / SURGE
GROUND ELEVATION	DATUM	

ACAD:FORM_MWFM.dwg 07/20/09 INL

ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: STEEL

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: CONCRETE

ELEVATION/DEPTH TOP OF SEAL: / 1'

TYPE OF SEAL: BENTONITE

ELEVATION/DEPTH TOP OF SAND: / 2.50'

ELEVATION/DEPTH TOP OF SCREEN: / 3.50'

TYPE OF SCREEN: 2" PVC

SLOT SIZE x LENGTH: 0.010" x 10'

TYPE OF SAND PACK: NO. 30-50

DIAMETER OF HOLE IN BEDROCK: 8"

ELEVATION / DEPTH BOTTOM OF SCREEN: / 13.50

ELEVATION / DEPTH BOTTOM OF SAND: / 13.50

ELEVATION/DEPTH BOTTOM OF HOLE: / 13.50

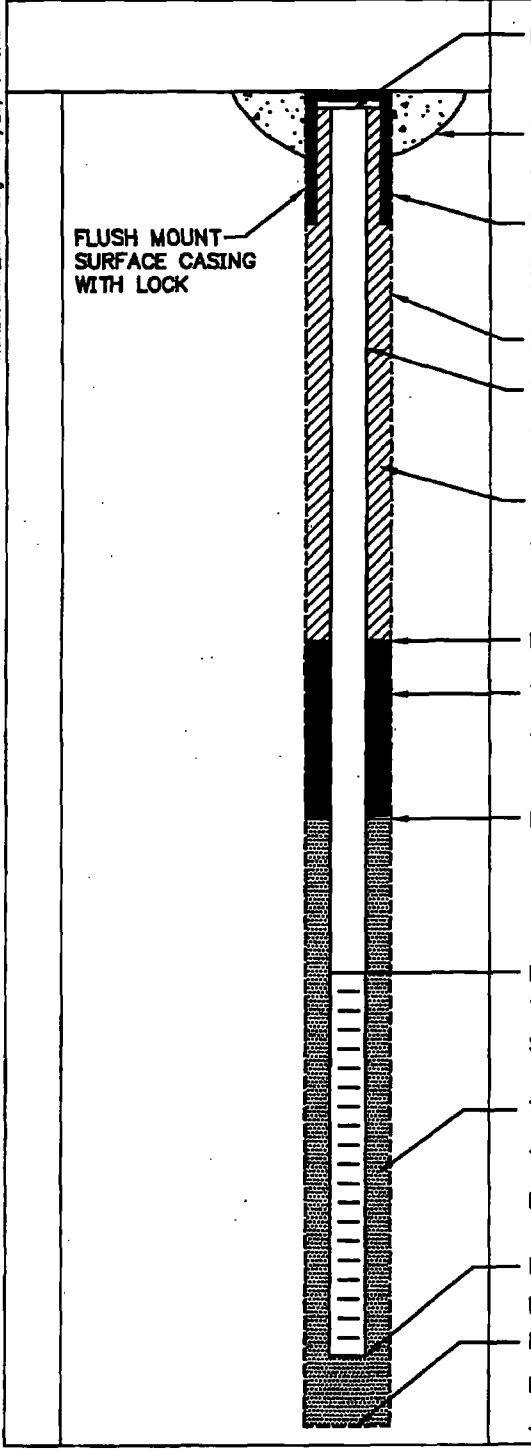
BACKFILL MATERIAL BELOW SAND: _____

WELL NO.: MWD4

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT: DSLL ATWATER	LOCATION: DETROIT, MI	DRILLER: TTL - CHARLIE MOORE
PROJECT NO.: 112 G02435	BORING: MWD4	DRILLING METHOD: HSA
DATE BEGUN: 5/24/11	DATE COMPLETED: 5/25/11	
FIELD GEOLOGIST: CHARLIE WARING		DEVELOPMENT METHOD: PUMP / SURGE
GROUND ELEVATION:	DATUM:	



ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: CONCRETE

TYPE OF PROTECTIVE CASING: STEEL

I.D. OF PROTECTIVE CASING: 8"

DIAMETER OF HOLE: 8"

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2"

TYPE OF BACKFILL/SEAL: CONCRETE

ELEVATION/DEPTH TOP OF SEAL: / 1'

TYPE OF SEAL: BENTONITE

ELEVATION/DEPTH TOP OF SAND: / 2.40'

ELEVATION/DEPTH TOP OF SCREEN: / 3.40

TYPE OF SCREEN: 2" PVC

SLOT SIZE x LENGTH: 0.010" X 10'

TYPE OF SAND PACK: NO. 30-50

DIAMETER OF HOLE IN BEDROCK: 8"

ELEVATION / DEPTH BOTTOM OF SCREEN: / 13.40

ELEVATION / DEPTH BOTTOM OF SAND: / 13.40

ELEVATION/DEPTH BOTTOM OF HOLE: / 13.40

BACKFILL MATERIAL BELOW SAND: _____

ACAD:FORM_MWFM.dwg 07/20/99 INL

APPENDIX A-7

WELL DEVELOPMENT LOGS

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW01
Site: USCG Atwater
Date Installed: 5/24/11
Date Developed: 5/25/11
Dev. Method: Pump / Surge
Pump Type: Submersible

Depth to Bottom (ft.): 13.10
Static Water Level Before (ft.): 3.05
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: Charlie Warino
Drilling Co.: TTL
Project Name: USCG Atwater
Project Number:

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
0940	0.0	1.0	3.00				MAX	GRAY
0942	0.0	20.0	3.10				358	
0951	0.0	33.0	3.10				1089	
1001	0.0	42.0	3.10				26	CLEAR
1005	0.0	50.0	3.10				7.6	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW-02
Site: USCG Atwater
Date Installed: 5/24/11
Date Developed: 5/25/11
Dev. Method: PUMP SURGE
Pump Type: SUBMERSIBLE
Depth to Bottom (ft.): 13.10
Static Water Level Before (ft.): 1.50
Static Water Level After (ft.):
Screen Length (ft.): 10'
Casing ID (in.): 2"
Responsible Personnel: Charlie Warino
Drilling Co.: TTL
Project Name: USCG Atwater
Project Number:

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1120	0.0	3.0	DRY				74	CREW PUMPED DRY, ALLOWING RECHARGE
1129	0.0	6.0	10.70				111	LOWERED PUMPING RATE
1135		12	10.64				64	CLEAR
1145		20	7.21				21	
1155		26	7.31				6.8	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW 03
Site: USCG Atwater
Date Installed: 5/24/11
Date Developed: 5/25/11
Dev. Method: Pump/surge
Pump Type: submersible

Depth to Bottom (ft.): 13.25
Static Water Level Before (ft.): 3.81
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"

Responsible Personnel: Charlie Warino
Drilling Co.: TTL
Project Name: USCG Atwater
Project Number:

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1010	0.0	1.0	3.81				MAX	GRAY
1013	0.0	6.0	6.10				5416	
1020	0.0	20.0	9.61				5281	
1031	0.0	35.0	12.10				5197	
1035	0.0	39.0	12.13				369	
1040	0.0	43.0	12.08				248	
1045	0.0	47.0	12.10				150	
1050	0.0	50.0	12.11				26.8	CLEAR
1053	0.0	52.0	12.10				9.7	

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: MW 04
Site: USCG Atwater
Date Installed: 5/24/11
Date Developed: 5/25/11
Dev. Method: Pump & Valve
Pump Type: Submersible
Depth to Bottom (ft.): 13.15
Static Water Level Before (ft.): 2.87
Static Water Level After (ft.):
Screen Length (ft.): 10'
Specific Capacity:
Casing ID (in.): 2"
Responsible Personnel: Charlie Warino
Drilling Co.: TTL
Project Name: USCG Atwater
Project Number:

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ____)	Turbidity (NTU)	Remarks (odor, color, etc.)
1210	0.0	3.0	8.60				MAX	GRAY
1215	0.0	13	8.15				1512	
1220	0.0	20	8.21				111	
1225	0.0	23	8.22				76.7	CLEAR
1230	0.0	26	8.20				4.3	

APPENDIX A-8

GROUNDWATER SAMPLE LOGS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02435

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: DA-GW-01-062011
Sample Location: MW01
Sampled By: CW
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 6/6/2011	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity ~~(%)~~ PPT	Other
Time: 1410								
Method: Peri pump	CLEAR	6.82	0.492	18.42	0.0	0.00	0.3	

PURGE DATA:

Date: 6/6/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: peri pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.10								
Static Water Level (WL): 2.22								
One Casing Volume(gal/L): 1.5								
Start Purge (hrs): 1325								
End Purge (hrs): 1410								
Total Purge Time (min): 45								
Total Vol. Purged (gal): 6.75								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	X
Metals	HNO3	1 x 250ml plastic	X
Diss Metals	HN03	1 x 250ml plastic	X

OBSERVATIONS / NOTES:

MS/MSD = 1 EXTRA VOLUME

Circle if Applicable:

MS/MSD	Duplicate ID No.:
X	

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02435
WELL ID.: MW 01
DATE: 6/6/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1825	2.22	150	6.51	0.866	37.0	0.20	22.87	-45	0.3	CLEAR
1830	2.26	150	6.90	1.01	28.8	0.00	14.69	-120	0.3	
1835	2.26	150	6.92	0.972	16.1	0.00	14.71	-140	0.3	
1840	2.26	150	6.94	0.958	0.0	0.00	14.77	-151	0.3	
1845	2.26	150	6.90	0.972	0.0	0.00	15.16	-158	0.3	
1850	2.26	150	6.87	0.978	0.0	0.00	15.31	-164	0.3	
1855	2.26	150	6.85	0.960	0.0	0.00	17.21	-170	0.3	
1900	2.26	150	6.83	0.949	0.0	0.00	18.26	-174	0.3	
1905	2.26	150	6.83	0.982	0.0	0.00	18.61	-175	0.3	
1910	2.26	150	6.82	0.992	0.0	0.00	18.42	-176	0.3	SAMPLED

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02435

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: DA-GW-02-062011
Sample Location: MW02
Sampled By: CW
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 6/6/2011	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1530	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(ppt)	
Method: Peri pump	clear	7.71	1.49	12.45	0.0	0.00	0.4	

PURGE DATA:

Date: 6/6/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: peri pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD): 13.10								
Static Water Level (WL): 3.95								
One Casing Volume (gal/L): 1.5								
Start Purge (hrs): 1445								
End Purge (hrs): 1530								
Total Purge Time (min): 45								
Total Vol. Purged (gal/L): 6.75								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	X
Metals	HNO3	1 x 250ml plastic	X
Diss Metals	HN03	1 x 250ml plastic	X

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02435
WELL ID.: MW 02
DATE: 6/6/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1445	3.95	150	6.95	1.28	5.3	1.83	15.94	-97	0.4	
1450	3.85	150	8.00	1.31	0.0	0.00	13.02	-104	0.4	
1455	4.21	150	7.92	1.46	0.0	0.00	12.99	-151	0.4	
1500	4.82	150	7.98	1.50	0.0	0.00	12.98	-190	0.4	
1505	5.05	150	8.04	1.51	0.0	0.00	12.99	-204	0.4	
1510	5.05	150	7.89	1.50	0.0	0.00	12.70	-200	0.4	
1515	5.05	150	7.80	1.50	0.0	0.00	12.60	-195	0.4	
1520	5.05	150	7.77	1.49	0.0	0.00	12.54	-191	0.4	
1523	5.05	150	7.73	1.49	0.0	0.00	12.44	-191	0.4	
1530	5.05	150	7.71	1.49	0.0	0.00	12.45	-192	0.4	SAMPLED

SIGNATURE(S): _____

PAGE___OF___

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02435

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: DA-GW-03-062011
Sample Location: MW03
Sampled By: C. WERTZ
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 6/6/2011	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: 1515								
Method: Peri pump	CLEAR	7.21	0.925	12.50	0.70	0.00	0.2	

PURGE DATA:

Date: 6/6/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: peri pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.25								
Static Water Level (WL): 3.89								
One Casing Volume (gal/L): ~1.5								
Start Purge (hrs): 1415								
End Purge (hrs): 1515								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 9.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	X
Metals	HNO3	1 x 250ml plastic	X
Diss Metals	HN03	1 x 250ml plastic	X

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.: DA-GW-FD-01	Signature(s): [signature]

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02435
WELL ID.: MW 03
DATE: 6/6/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1415	3.89	150	7.23	0.964	20	0.00	25.64	-78	0.3	
1420	3.93	"	7.09	0.857	20	0.00	18.02	-70	0.2	
1425	3.96	"	7.08	0.832	15	0.00	17.27	-71	0.2	
1430	3.97	"	7.07	0.834	12	0.00	17.49	-76	0.2	
1435	3.98	"	7.04	0.847	6.8	0.00	17.45	-85	0.2	
1440	3.99	"	7.10	0.864	5.7	0.00	17.51	-90	0.2	
1445	4.00	"	7.14	0.891	1.0	0.00	17.43	-99	0.2	
1450	4.00	"	7.16	0.904	1.3	0.00	17.51	-102	0.2	
1455	4.00	"	7.18	0.914	0.45	0.00	17.46	-104	0.2	
1500	4.00	"	7.19	0.922	0.49	0.00	17.51	-106	0.2	
1505	4.01	"	7.20	0.924	0.60	0.00	17.50	-107	0.2	
1510	4.01	"	7.21	0.925	0.70	0.00	17.50	-107	0.2	SAMPLES

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02435

Sample ID No.: DA-GW-04-062011
Sample Location: MW04
Sampled By: CWERTZ
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 6/6/2011	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1334	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	~~(%)~~ ppt	
Method: Peri pump	clear	7.32	0.694	16.12	1.7	0.00	0.2	

PURGE DATA:

Date: 6/6/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: peri pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.15								
Static Water Level (WL): 3.18								
One Casing Volume(gal/L): ~1.6								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	X
Metals	HNO3	1 x 250ml plastic	X
Diss Metals	HN03	1 x 250ml plastic	X

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02435
WELL ID.: MW4
DATE: 6/6/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1235	3.18	150	5.49	0.735	217	1.76	15	51	0.2	
1240	3.24	"	7.10	0.631	95	0.00	16.33	-38	0.2	
1245	3.36	"	7.38	0.646	60	0.00	16.33	-43	0.2	
1250	3.41	"	7.40	0.668	50	0.00	16.36	-42	0.2	
1255	3.42	"	7.35	0.684	22	0.00	16.27	-46	0.2	
1306	3.43	"	7.36	0.694	7.2	0.00	16.20	-48	0.2	
1305	3.45	"	7.36	0.698	6	0.00	16.20	-49	0.2	
1310	3.47	"	7.35	0.697	6.9	0.00	16.12	-49	0.2	
1315	3.49	"	7.35	0.695	4.9	0.00	16.13	-50	0.2	
1320	3.51	"	7.34	0.694	0.95	0.00	16.09	-50	0.2	
1325	3.53	"	7.32	0.694	1.7	0.00	16.12	-53	0.2	SAMPLE SET.

SIGNATURE(S): _____

APPENDIX A-9

WATER LEVEL MEASUREMENTS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: USCG Atwatre
Project No.: 112G02435
Location: Detroit, MI
Personnel: CW, CW
Weather Conditions: 80° Sunny
Measuring Device: HERRON WLM
Tidally Influenced: Yes ___ No Y
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MW01	6/6/2011	1140		13.10	2.22			
MW02	6/6/2011	1141		13.10	3.95			
MW03	6/6/2011	1142		13.25	3.89			
MW04	6/6/2011	1143		13.15	3.18			
RIVER	6/6/2011	1145		—	3.85			

* All measurements to the nearest 0.01 foot

APPENDIX A-10

CHAIN OF CUSTODY FORMS – 2010

[redacted]

TRIMATRIX LABORATORIES

5560 Corporate Exchange Court SE
Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 133654

Pg. 1 of 4

Client Name	Tetra Tech NUS	Project Name	Detroit Airport
Address	661 Andersen Dr	Client Project No. / P.O. No.	
City, State Zip	Pittsburgh PA 15220	Invoice To	☒ Client ☐ Other (comments)
Phone/Fax	412-921-7090	Contact/Report To	Joe Logan
Email	Shannon.Hill@Tetratech.com		

Analyses Requested: (1) PAH — Preservative A; (2) MtlTs — Preservative A

PRESERVATIVES
- A NONE pH~7
- B HNO_3 pH<2
- C H_2SO_4 pH<2
- D 1+1 HCl pH<2
- E NaOH pH>12
- F ZnAc/NaOH pH>9
- G MeOH
- H Other (note below)

#	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	PAH	MtlTs	Total	Sample Comments
1	DASB106-0002		4/20/10	0955		X	Soil	X	X	1	
2	DASB106-0305		↓	1005		↓	↓	↓	↓	1	
3	DASB102-0002		↓	1030		↓	↓	↓	↓	1	
4	DASB102-0305		↓	1040		↓	↓	↓	↓	1	
5	DASB110-0002		↓	1125		↓	↓	↓	↓	3	Run MS/MSD
6	DASB110-0305		↓	1140		↓	↓	↓	↓	1	
7	DASB112-0002		↓	1455		↓	↓	↓	↓	1	
8	DASB112-0305		↓	1505		↓	↓	↓	↓	1	
9	DASB111-0002		↓	1530		↓	↓	↓	↓	1	
10	DASBFD-01		↓	00:00		↓	↓	↓	↓	1	Dup of DASB111-0002

Sampled By (print): Shannon Hill

Sampler's Signature:

Company: TtNUS

How Shipped? Hand ___ Carrier X

Tracking No.

Comments:
(1) SW-846, 8270C, or D SIM
(2) SW-846 6010B, C, or 6020/A (Auch. 1C. Metals)

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	4/21/10	1230						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**			
	4/22/10	1230						

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TRIMATRIX LABORATORIES

5560 Corporate Exchange Court SE
Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 133655

Pg. 2 of 4

[redacted]

Analyses Requested

Client Name	Tetra Tech NUS
Project Name	Detroit Hawaiian
Address	661 Andersen Dr.
Client Project No. / P.O. No.	
City, State Zip	Pittsburgh, PA 15220
Invoice To	☒ Client ☐ Other (comments)
Phone/Fax	412 921-7090
Contact/Report To	Joe Logan
Email	Shannon.Hill@Tetratech.com

PRESERVATIVES
A NONE pH-7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
1	~~DASB111-0002~~		~~4/20/10~~	~~1530~~		~~X~~	~~SB~~			
2	DASB111-0305		4/20/10	1540		X	SB		2	Lab Dup
3	DASBFD-02			00:00					1	DASB115-0002
4	DASBFD-03			00:00					1	DASB109-0002
5	DASB115-0002			1600					1	
6	DASB115-0305			1610					1	
7	DASB109-0002			1625					1	
8	DASB109-0305			1635					1	
9	DASB104-0002			1645					1	
10	DASB104-0305			1655					1	

Sampled By (print): Shannon Hill

How Shipped? Hand ___ Carrier X

Sampler's Signature: [signature]

Tracking No.

Comments
① SW-846 8270C or D SIM
② SW-846 6010B, C, or 6020/A (Mich 10 metals)

Company: HNUS

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	4/21/10	1230						

1. Received By	Date	Time	2. Received By	Date	Time
[signature]	4/21/10	1230			

[redacted]

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TRIMATRIX LABORATORIES

5560 Corporate Exchange Court SE
Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 133659

Pg. 3 of 4

Analyses Requested

Client Name: Tetra Tech NUS	Project Name: Detroit Atwater
Address: 661 Andersen Dr	Client Project No. / P.O. No.
City, State Zip: Pittsburgh PA 15220	Invoice To: ☒ Client ☐ Other (comments)
Phone/Fax: 412-921-7090	Contact/Report To: Joe Logan
Email: Shannon.Hill@TetraTech.com	

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

#	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	PQH ①	Metals ②	Total	Sample Comments
1	DASB114-0002		4/21/10	0910		X	soil	X	X	2	(no) Dup
2	DASB114-0305		↓	0915		↓	↓	↓	↓	1	
3	DASB107-0002		↓	0945		↓	↓	↓	↓	3	Run MS/MSD
4	DASB107-0201		↓	0950		↓	↓	↓	↓	1	
5	DASB105-0002		↓	1010		↓	↓	↓	↓	1	
6	DASB105-0305		↓	1015		↓	↓	↓	↓	1	
7	DASB103-0002		↓	1030		↓	↓	↓	↓	1	
8	DASB103-0305		↓	1035		↓	↓	↓	↓	1	
9	DASB108-0002		↓	1045		↓	↓	↓	↓	1	
10	DASB108-0305		↓	1055		↓	↓	↓	↓	1	

Sampled By (print): Shannon Hill
Sampler's Signature: [signature]
Company: TNUS

How Shipped? Hand ___ Carrier X
Tracking No.

Comments:
① SW-846 8270C or D SIM
② SW-846 6010B, C, or 6020/A (Mic in 10 Metals)

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	4/21/10	1230						

1. Received By	Date	Time	2. Received By	Date	Time
[signature]	4/21/10	1230			

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TRIMATRIX LABORATORIES

5560 Corporate Exchange Court SE
Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 133657

Pg. 4 of 4

Analyses Requested

Client Name: Tetra Tech NUS	Project Name:
Address: 661 Anderson Drive	Client Project No. / P.O. No.:
City, State Zip:	Invoice To: ☐ Client ☐ Other (comments)
Phone/Fax:	Contact/Report To:
Email:	

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	TCLP VOC	TCLP metals	PH	FAH	Metals						Total	Sample Comments
1	DA-IDW-01		4/21/10	1140			Soil	x	x	x								2	
2	DA IDW-02		↓	1145			Aq	3	1	1								5	
3	✓DASB101-0062		↓	1105			Soil				x	x						1	
4	✓DASB101-0305		↓	1110			Soil				X	X						1	
5																			
6																			
7																			
8																			
9																			
10																			

Number of Containers Submitted

Sampled By (print): Shannon Hill	How Shipped? Hand ___ Carrier X	Comments	
Sampler's Signature: [signature]	Tracking No.		
Company: TT NUS	1. Relinquished By: [signature] Date 4/21/10 Time 1230	2. Relinquished By Date Time	3. Relinquished By Date Time
	1. Received By: [signature] Date 4/21/10 Time 1230	2. Received By Date Time	

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APPENDIX A-11

CHAIN OF CUSTODY FORMS – 2011

TRIMATRIX LABORATORIES
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Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 138762

Pg. 1 of 2

Analyses Requested

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Client Name	TETRA TECH NUS, INC.
Address	661 ANDERSEN DR
City, State Zip	PITTSBURGH, PA 15220
Phone/Fax	(412) 921-7090 / (412) 921-4040
Email	JOE.LOGAN@TETRATECH.COM
Project Name	USCG ATWATER
Client Project No. / P.O. No.	112G02435
Invoice To	☒ Client ☐ Other (comments)
Contact/Report To	TORENA SEDLACEK

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted: PAH 8270C	Hg 7471A	TCLP VOCs	TCLP Metals	Flash PH	Total	Sample Comments
1	DISPOSAL-01		5/25/11	1330	X		SOIL			1	1	1	2	250 ml. 125 ml.
2	DA-SS-102-0002			0920		X		1	1	1			2	MS/MSD 2-250ml.
3	DA-SB-102-0406			0925				1	1				1	250ml. glass
4	DA-SS-FD-01			0000				1	1				1	
5	DA-SB-FD-01			0000				1	1				1	
6	DA-SS-104-0002			1100				1	1				1	
7	DA-SB-104-0204			1105				1	1				1	
8	DA-SS-106-0002			1310				1	1				1	
9	DA-SB-106-0204			1315				1	1				1	
10	DA-SS-109-0002			1115		X	SOIL	1	1				1	

Sampled By (print)	CHARLIE WARNO	How Shipped? Hand ___ Carrier FED EX	Comments
Sampler's Signature		Tracking No. 8747 4934 2590	
Company	TETRA TECH	1. Relinquished By / Date 5/25 / Time 1600	2. Relinquished By / Date / Time
		1. Received By / Date / Time	2. Received By / Date / Time

3. Relinquished By / Date / Time

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TRIMATRIX LABORATORIES

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Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 138763

Pg. 2 of 2

Analyses Requested

Client Name	TETRA TECH NUS, INC.
Project Name	USCG ATWATER
Address	661 ANDERSEN DR
Client Project No. / P.O. No.	112602435
City, State Zip	PITTSBURGH, PA 15220
Invoice To	☒ Client ☐ Other (comments)
Phone/Fax	412-921-7090 / 412-921-4040
Contact/Report To	TOBRENA SEDLMYER
Email	JOE.LOGAN@TETRATECH.COM

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	PAH 8270C	Hg 9471A									Total	Sample Comments
1	DA-SB-109-0204		5/25/11	1120		X	soil	1	1									1	
2	DA-SB-110-0305			1155				1	1									1	
3	DA-SS-110-0002			1150				1	1									1	
4	DA-SS-111-0002			1220				1	1									1	
5	DA-SB-111-0305			1225				1	1									1	
6	DA-SS-112-0002			1340				1	1									1	
7	DA-SB-112-0204			1345				1	1									1	
8	DA-SB-115-0204			1400				1	1									1	
9	DA-SS-115-0002		5/25/11	1355		X	soil	1	1									1	
10																			

Number of Containers Submitted

Sampled By (print)	CHARLIE WARWO
Sampler's Signature	[signature]
Company	TETRA TECH
How Shipped?	Hand ___ Carrier FED EX
Tracking No.	8747 4934 2590
1. Relinquished By	[signature] Date 5/25 Time 1600
1. Received By	Date Time
Comments	
2. Relinquished By	Date Time
2. Received By	Date Time
3. Relinquished By	Date Time

[redacted]

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TRIMATRIX LABORATORIES
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 138929

Pg. 1 of 1

00011

[redacted]

Client Name	Project Name
TETRA TECH NUS, INC.	USCG ATWATER
Address: 661 ANDERSEN DR	Client Project No. / P.O. No.
City, State Zip: PITTSBURGH, PA 15220	Invoice To ☐ Client ☐ Other (comments)
Phone/Fax: 412-921-7090 412-921 4090	Contact/Report To: TOBRENA SEDLMAYER
Email: JOEL.LOEW@TETRATECH.COM	

Analyses Requested

A	B	D								
PAH	TOTAL METALS	DISS. METALS								

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
1	DA-GW-01-062011	Ø1	6/6/11	1410		X	GW	4	2	2									MS/MSD
2	DA-GW-02-062011	Ø1		1530		X		2	1	1									
3	DA-GW-03-062011	Ø2		1515		X		2	1	1									
4	DA-GW-04-062011	Ø2		1334		X		2	1	1									
5	DA-GW-FD-01	Ø2	6/6/11	0000		X	GW	2	1	1									
6																			
7																			
8																			
9																			
10																			

Sampled By (print): CHARLES WARING
Sampler's Signature: [signature]
Company: TETRA TECH

How Shipped? Hand ___ Carrier FED EX
Tracking No. 8747 4934 2580

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	6/6/11	1800				[redacted]		
1. Received By	Date	Time	2. Received By	Date	Time			

Comments

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

APPENDIX A-12

CALIBRATION LOG

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: USCG ATWATER

INSTRUMENT NAME/MODEL: HORIBA U-50

SITE NAME: ATWATER

MANUFACTURER: HORIBA

PROJECT No.: 112602435

SERIAL NUMBER: T7XV60138 / US9L00X

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
6/6	T7XV60138	CW	pH 4.0	4.00				
			COND 4.45	4.50				
			TURB 6.2	0.0				
			TEMP 21.35	21.49				
	US9L00X	CW	pH 4.07	4.00				
			COND 4.77	4.64				
			TURB 8.3	0.0				
			TEMP 21.16	21.10				

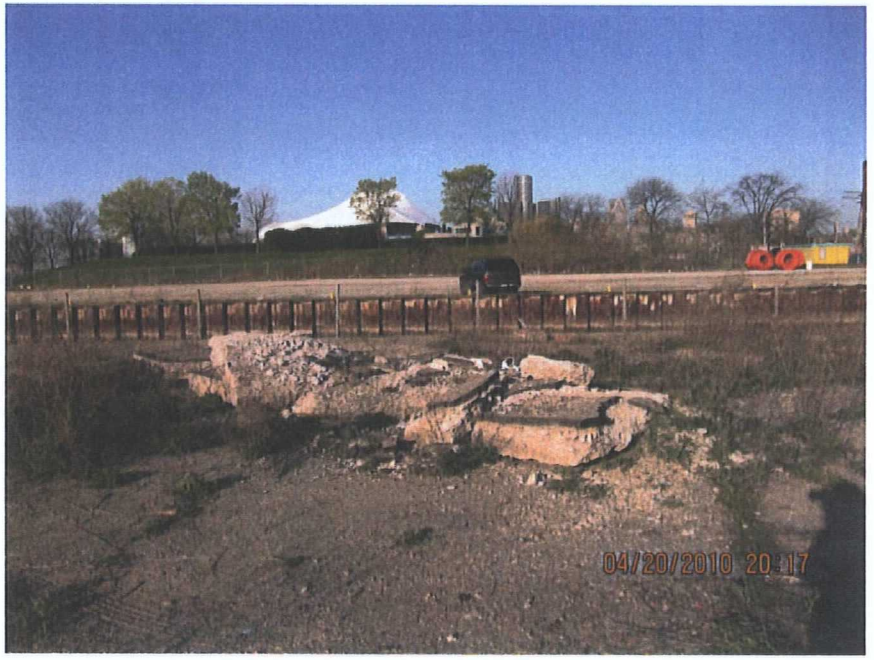
APPENDIX A-13

SITE PHOTOGRAPHS

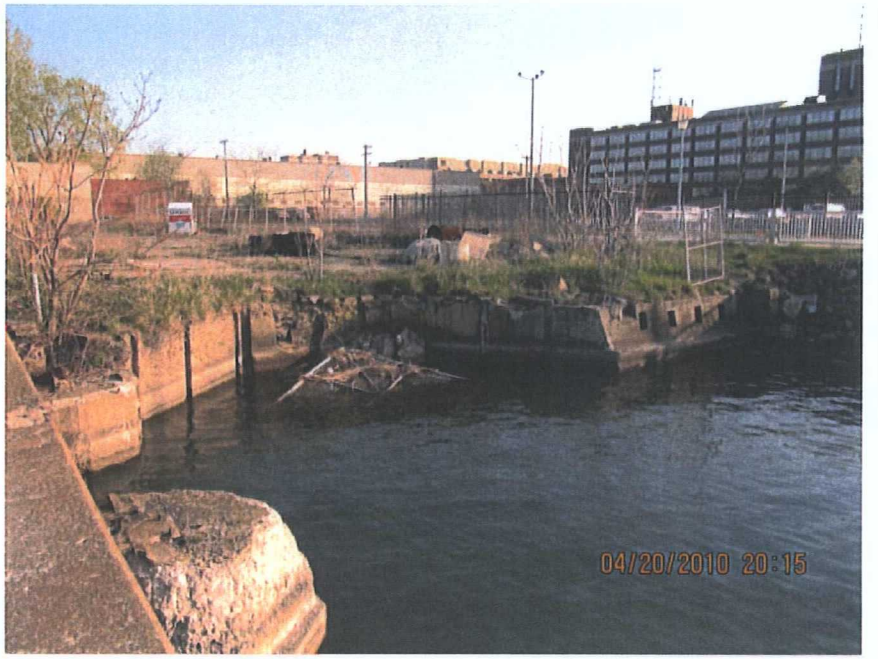
Detroit Atwater Photos

Looking at the Site from Atwater Street

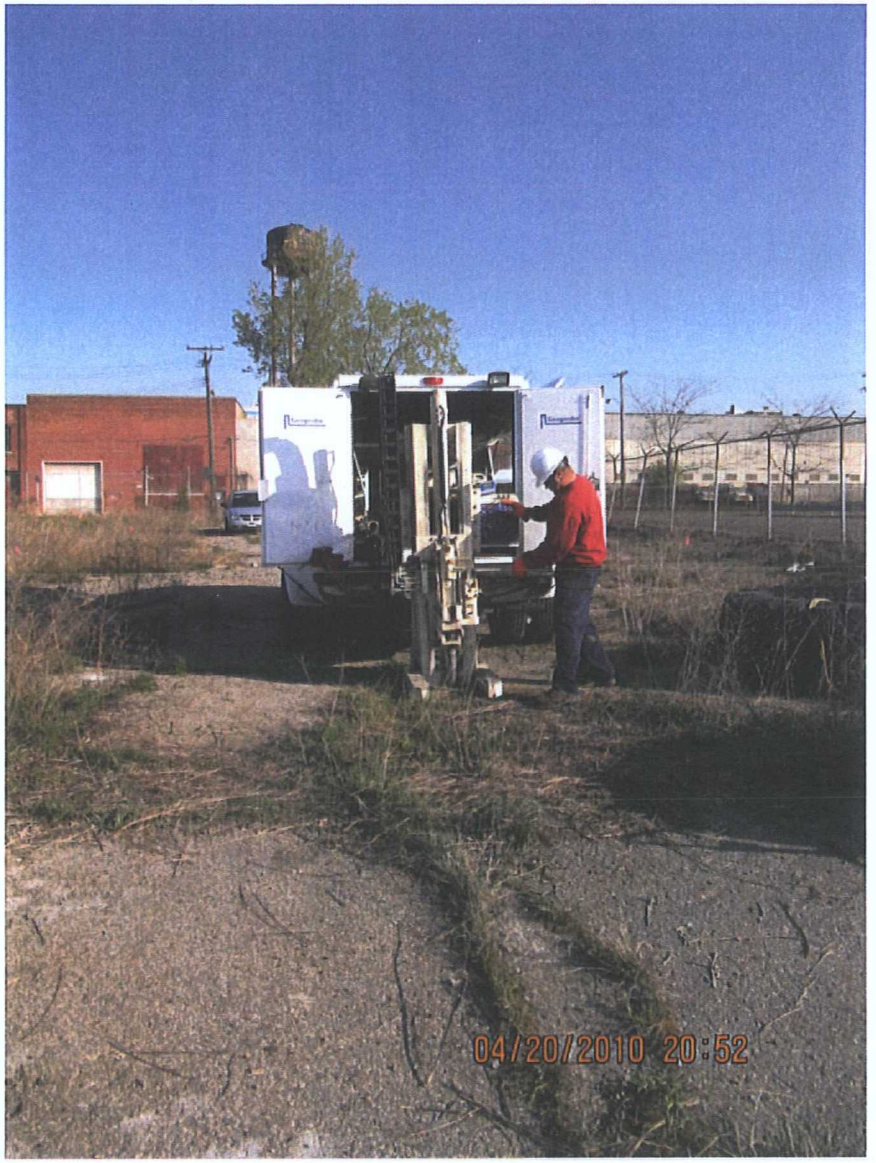
Looking at the Site from the Detroit River.



Concrete debris



Looking in from the River at the concrete wall



2010 DPT Advancing at SB114

Coring attempts at the southern/river end of the Site.

Hollow Stem Auger Monitoring Well Installation

Complete Monitoring Well

B

APPENDIX B

SI DATA TABLES AND LABORATORY REPORTS (INCLUDING DATA VALIDATION REPORTS)

DATA TABLES

TABLE C-2

FULL APPENDIX GROUNDWATER
SITE INSPECTION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION			DAMW01	DAMW02		DAMW03		DAMW04
SAMPLE ID			DA-GW-01-062011	DA-GW-02-062011	DA-GW-03-062011	DA-GW-03-062011-AVG	DA-GW-03-062011-D	DA-GW-04-062011
SAMPLE DATE			20110606	20110606	20110606	20110606	20110606	20110606
SAMPLE CODE	Federal	Michigan	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL
MATRIX	MCL	Residential	GW	GW	GW	GW	GW	GW
SAMPLE TYPE		RBSL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX			NA	NA	NA	NA	NA	NA
TOP DEPTH			-9999	-9999	-9999	-9999	-9999	-9999
BOTTOM DEPTH			-9999	-9999	-9999	-9999	-9999	-9999
DISSOLVED METALS (UG/L)								
ARSENIC	10	10	0.95 J	1 J	2.7 J	2.7	2.7 J	3 J
BARIUM	2000	2000	190 J	200 J	310 J	305	300 J	150 J
CADMIUM	5	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHROMIUM	100	100	0.3 J	0.47 J	0.21 J	0.21 J	1 U	1 U
COPPER	1300	1000	0.44 J	0.42 J	1 U	1 U	1 U	0.88 J
LEAD	15	4	0.17 J	0.2 J	1 U	1 U	1 U	0.44 J
MERCURY	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SELENIUM	50	50	5 UJ	5 UJ	5 UJ	5 U	5 UJ	5 UJ
SILVER	NC	34	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ZINC	NC	2400	5.5	5 U	4.2 J	4.05	3.9 J	110
METALS (UG/L)								
ARSENIC	10	10	1.5 J	6.2	2.6 J	2.55	2.5 J	3 J
BARIUM	2000	2000	210	150	290	290	290	150
CADMIUM	5	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHROMIUM	100	100	0.31 J	0.33 J	0.29 J	0.28	0.27 J	0.36 J
COPPER	1300	1000	0.74 J	1.2	0.77 J	0.77 J	1 U	2.6
LEAD	15	2	0.73 J	0.85 J	0.47 J	0.4	0.33 J	2.1
MERCURY	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
SELENIUM	50	50	5 UJ	1 J	5 UJ	5 U	5 UJ	5 UJ
SILVER	NC	34	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ZINC	NC	2400	6.9 J	3.9 J	8.5 J	6.55	4.6 J	110 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)								
2-METHYLNAPHTHALENE	NC	260	0.5 U	24 J	0.07 J	0.07 J	0.5 U	0.5 U
ACENAPHTHENE	NC	1300	0.5 U	6 J	1.6	1.6	1.6	0.05 J
ACENAPHTHYLENE	NC	52	0.5 U	1.7 J	0.05 J	0.05 J	0.5 U	0.5 U
ANTHRACENE	NC	43	0.5 U	3.8 J	0.22 J	0.205	0.19 J	0.5 U
BAP EQUIVALENT-HALFND			0.5 U	0.5786	0.5 U	0.5 U	0.5 U	0.5 U
BAP EQUIVALENT-POS			0.5 U	0.0286	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(A)ANTHRACENE	NC	2	0.5 U	0.28 J	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(A)PYRENE	0.2	5	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(B)FLUORANTHENE	NC	1.5	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(G,H,I)PERYLENE	NC	1	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(K)FLUORANTHENE	NC	1	0.5 U	0.05 J	0.5 U	0.5 U	0.5 U	0.5 U
CHRYSENE	NC	1.6	0.5 U	0.1 J	0.5 U	0.5 U	0.5 U	0.5 U
DIBENZO(A,H)ANTHRACENE	NC	2	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
FLUORANTHENE	NC	210	0.5 U	0.52 J	0.2 J	0.175	0.15 J	0.5 U
FLUORENE	NC	880	0.5 U	3.5 J	0.36 J	0.315	0.27 J	0.5 U
INDENO(1,2,3-CD)PYRENE	NC	2	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
NAPHTHALENE	NC	520	0.5 U	120	0.19 J	0.15	0.11 J	0.05 J
PHENANTHRENE	NC	52	0.5 U	8.8 J	1.2	1.1	1	0.05 J
PYRENE	NC	140	0.5 U	0.39 J	0.15 J	0.14	0.13 J	0.04 J

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION						DASS101	DASB101	DASS102	
SAMPLE ID						DASS101-0002	DASB101-0305	DASS102-0002	DASS102A-0002
SAMPLE DATE						20100421	20100421	20100420	20110525
SAMPLE CODE						NORMAL	NORMAL	NORMAL	ORIG
MATRIX	RES	IND	DWPC	GSI	STATE BKG	SO	SO	SO	SO
SAMPLE TYPE						NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX						SS	SB	SS	SS
TOP DEPTH						0	3	0	0
BOTTOM DEPTH						2	5	2	2
METALS (MG/KG)									
ARSENIC	7.6	37	4.6	23	5.8	5.7	7.6	5.7	
BARIUM	37000	130000	1300	440	75	59	90	56	
CADMIUM	550	2100	6	3	1.2	0.28	0.23	0.27	
CHROMIUM	2500	9200	30	3.3	18	15	18	14 J	
COPPER	20000	73000	5800	75	32	16	23	16	
LEAD	400	900	700	2500	2.1	31	180	34	
MERCURY	160	580	1.7	0.05	0.13	0.062	0.3 J		0.053
SELENIUM	2600	9600	4	0.4	0.41	0.28	0.37	0.18	
SILVER	2500	9000	4.5	0.1	1	0.079	0.13	0.072	
ZINC	170000	630000	2400	170	47	62	93	62	
MISCELLANEOUS PARAMETERS (%)									
PERCENT MOISTURE									
PERCENT SOLIDS									87
TOTAL SOLIDS						88	87	87	
PESTICIDES/PCBS (UG/KG)									
4,4'-DDD									
4,4'-DDE									
4,4'-DDT									
ALDRIN									
ALPHA-BHC									
ALPHA-CHLORDANE									
AROCLOR-1016									
AROCLOR-1221									
AROCLOR-1232									
AROCLOR-1242									
AROCLOR-1248									
AROCLOR-1254									
AROCLOR-1260									
BETA-BHC									
CHLORDANE (TECHNICAL)									
DELTA-BHC									
DIELDRIN									
ENDOSULFAN I									
ENDOSULFAN II									
ENDOSULFAN SULFATE									
ENDRIN									
ENDRIN ALDEHYDE									
ENDRIN KETONE									
GAMMA-BHC (LINDANE)									
GAMMA-CHLORDANE									
HEPTACHLOR									
HEPTACHLOR EPOXIDE									
METHOXYCHLOR									
TOXAPHENE									

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION						DASS101	DASB101	DASS102	
SAMPLE ID						DASS101-0002	DASB101-0305	DASS102-0002	DASS102A-0002
SAMPLE DATE						20100421	20100421	20100420	20110525
SAMPLE CODE						NORMAL	NORMAL	NORMAL	ORIG
MATRIX	RES	IND	DWPC	GSI	STATE	SO	SO	SO	SO
SAMPLE TYPE					BKG	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX						SS	SB	SS	SS
TOP DEPTH						0	3	0	0
BOTTOM DEPTH						2	5	2	2
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
2-METHYLNAPHTHALENE	8100	26000	57	NC	NC	4.5 J	7 J		270
ACENAPHTHENE	41000	130000	300	4.4	NC	13 J	23		120 J
ACENAPHTHYLENE	1600	5200	5.9	NC	NC	7.1 J	17 J		190 U
ANTHRACENE	230000	730000	41	NC	NC	59	110		250 J
BAP EQUIVALENT-HALFND						224.66	460.73		628.38
BAP EQUIVALENT-POS						224.66	460.73		533.38
BENZO(A)ANTHRACENE	20	80	NC	NC	NC	180	490		540 J
BENZO(A)PYRENE	2	8	NC	NC	NC	150	310		400 J
BENZO(B)FLUORANTHENE	20	80	NC	NC	NC	200	280		580 J
BENZO(G,H,I)PERYLENE	2500	7000	NC	NC	NC	110	150		220
BENZO(K)FLUORANTHENE	200	800	NC	NC	NC	69	230		180 J
CHRYSENE	2000	8000	NC	NC	NC	170	430		580 J
DIBENZO(A,H)ANTHRACENE	2	8	NC	NC	NC	26	56		190 U
FLUORANTHENE	46000	130000	730	5.5	NC	370	860		1000
FLUORENE	27000	87000	390	5.3	NC	18 J	24		220
INDENO(1,2,3-CD)PYRENE	20	80	NC	NC	NC	98	150		190
NAPHTHALENE	16000	52000	35	0.87	NC	5.8 J	8.5 J		200
PHENANTHRENE	1600	5200	56	5.3	NC	210	370		1200 J
PYRENE	29000	84000	480	NC	NC	300	720		970 J
SEMIVOLATILES (UG/KG)									
1,2,4-TRICHLOROBENZENE									
1,2-DICHLOROBENZENE									
1,3-DICHLOROBENZENE									
1,4-DICHLOROBENZENE									
2,2'-OXYBIS(1-CHLOROPROPANE)									
2,4,5-TRICHLOROPHENOL									
2,4,6-TRICHLOROPHENOL									
2,4-DICHLOROPHENOL									
2,4-DIMETHYLPHENOL									
2,4-DINITROPHENOL									
2,4-DINITROTOLUENE									
2,6-DINITROTOLUENE									
2-CHLORONAPHTHALENE									
2-CHLOROPHENOL									
2-METHYLNAPHTHALENE	8100	26000	57	NC	NC				
2-METHYLPHENOL									
2-NITROANILINE									
2-NITROPHENOL									
3&4-METHYLPHENOL									
3,3'-DICHLOROBENZIDINE									
3-NITROANILINE									
4,6-DINITRO-2-METHYLPHENOL									
4-BROMOPHENYL PHENYL ETHER									
4-CHLORO-3-METHYLPHENOL									

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION						DASS101	DASB101	DASS102	
SAMPLE ID						DASS101-0002	DASB101-0305	DASS102-0002	DASS102A-0002
SAMPLE DATE						20100421	20100421	20100420	20110525
SAMPLE CODE						NORMAL	NORMAL	NORMAL	ORIG
MATRIX	RES	IND	DWPC	GSI	STATE	SO	SO	SO	SO
SAMPLE TYPE					BKG	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX						SS	SB	SS	SS
TOP DEPTH						0	3	0	0
BOTTOM DEPTH						2	5	2	2
4-CHLOROANILINE									
4-CHLOROPHENYL PHENYL ETHER									
4-NITROANILINE									
4-NITROPHENOL									
ACENAPHTHENE	41000	130000	300	4.4	NC				
ACENAPHTHYLENE	1600	5200	5.9	NC	NC				
ANTHRACENE	230000	730000	41	NC	NC				
BAP EQUIVALENT-HALFND									
BAP EQUIVALENT-POS									
BENZO(A)ANTHRACENE	20	80	NC	NC	NC				
BENZO(A)PYRENE	2	8	NC	NC	NC				
BENZO(B)FLUORANTHENE	20	80	NC	NC	NC				
BENZO(G,H,I)PERYLENE	2500	7000	NC	NC	NC				
BENZO(K)FLUORANTHENE	200	800	NC	NC	NC				
BIS(2-CHLOROETHOXY)METHANE									
BIS(2-CHLOROETHYL)ETHER									
BIS(2-ETHYLHEXYL)PHTHALATE									
BUTYL BENZYL PHTHALATE									
CARBAZOLE									
CHRYSENE	2000	8000	NC	NC	NC				
DIBENZO(A,H)ANTHRACENE	2	8	NC	NC	NC				
DIBENZOFURAN									
DIETHYL PHTHALATE									
DIMETHYL PHTHALATE									
DI-N-BUTYL PHTHALATE									
DI-N-OCTYL PHTHALATE									
FLUORANTHENE	46000	130000	730	5.5	NC				
FLUORENE	27000	87000	390	5.3	NC				
HEXACHLOROBENZENE									
HEXACHLOROBUTADIENE									
HEXACHLOROCYCLOPENTADIENE									
HEXACHLOROETHANE									
INDENO(1,2,3-CD)PYRENE	20	80	NC	NC	NC				
ISOPHORONE									
NAPHTHALENE	16000	52000	35	0.87	NC				
NITROBENZENE									
N-NITROSO-DI-N-PROPYLAMINE									
N-NITROSODIPHENYLAMINE									
PENTACHLOROPHENOL									
PHENANTHRENE	1600	5200	56	5.3	NC				
PHENOL									
PYRENE	29000	84000	480	NC	NC				

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION						DASS101	DASB101	DASS102	
SAMPLE ID						DASS101-0002	DASB101-0305	DASS102-0002	DASS102A-0002
SAMPLE DATE						20100421	20100421	20100420	20110525
SAMPLE CODE						NORMAL	NORMAL	NORMAL	ORIG
MATRIX	RES	IND	DWPC	GSI	STATE	SO	SO	SO	SO
SAMPLE TYPE					BKG	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX						SS	SB	SS	SS
TOP DEPTH						0	3	0	0
BOTTOM DEPTH						2	5	2	2
VOLATILES (UG/KG)									
1,1,1,2-TETRACHLOROETHANE									
1,1,1-TRICHLOROETHANE									
1,1,2,2-TETRACHLOROETHANE									
1,1,2-TRICHLOROETHANE									
1,1,2-TRICHLOROTRIFLUOROETHANE									
1,1-DICHLOROETHANE									
1,1-DICHLOROETHENE									
1,1-DICHLOROPROPENE									
1,2,3-TRICHLOROBENZENE									
1,2,3-TRICHLOROPROPANE									
1,2,3-TRIMETHYLBENZENE									
1,2,4-TRICHLOROBENZENE									
1,2,4-TRIMETHYLBENZENE									
1,2-DIBROMO-3-CHLOROPROPANE									
1,2-DIBROMOETHANE									
1,2-DICHLOROBENZENE									
1,2-DICHLOROETHANE									
1,2-DICHLOROPROPANE									
1,3,5-TRIMETHYLBENZENE									
1,3-DICHLOROBENZENE									
1,3-DICHLOROPROPANE									
1,4-DICHLOROBENZENE									
2,2-DICHLOROPROPANE									
2-BUTANONE									
2-CHLOROETHYL VINYL ETHER									
2-CHLOROTOLUENE									
2-HEXANONE									
2-METHYLNAPHTHALENE									
2-NITROPROPANE									
4-CHLOROTOLUENE									
4-ISOPROPYLTOLUENE									
4-METHYL-2-PENTANONE									
ACETONE									
ACRYLONITRILE									
BENZENE									
BROMOBENZENE									
BROMOCHLOROMETHANE									
BROMODICHLOROMETHANE									
BROMOFORM									
BROMOMETHANE									
CARBON DISULFIDE									
CARBON TETRACHLORIDE									
CHLOROBENZENE									
CHLORODIBROMOMETHANE									
CHLOROETHANE									
CHLOROFORM									
CHLOROMETHANE									

LOCATION						DASS101	DASB101	DASS102	
SAMPLE ID						DASS101-0002	DASB101-0305	DASS102-0002	DASS102A-0002
SAMPLE DATE						20100421	20100421	20100420	20110525
SAMPLE CODE						NORMAL	NORMAL	NORMAL	ORIG
MATRIX	RES	IND	DWPC	GSI	STATE	SO	SO	SO	SO
SAMPLE TYPE					BKG	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX						SS	SB	SS	SS
TOP DEPTH						0	3	0	0
BOTTOM DEPTH						2	5	2	2
CIS-1,2-DICHLOROETHENE									
CIS-1,3-DICHLOROPROPENE									
DIBROMOMETHANE									
DICHLORODIFLUOROMETHANE									
DIETHYL ETHER									
DIISOPROPYL ETHER									
ETHYL METHACRYLATE									
ETHYL TERT-BUTYL ETHER									
ETHYLBENZENE									
HEXACHLOROBUTADIENE									
HEXACHLOROETHANE									
ISOPROPYLBENZENE									
M+P-XYLENES									
METHYL IODIDE									
METHYL TERT-BUTYL ETHER									
METHYLENE CHLORIDE									
NAPHTHALENE									
N-BUTYLBENZENE									
N-PROPYLBENZENE									
O-XYLENE									
SEC-BUTYLBENZENE									
STYRENE									
TERT-AMYL METHYL ETHER									
TERT-BUTYLBENZENE									
TERTIARY-BUTYL ALCOHOL									
TETRACHLOROETHENE									
TOLUENE									
TOTAL XYLENES									
TRANS-1,2-DICHLOROETHENE									
TRANS-1,3-DICHLOROPROPENE									
TRANS-1,4-DICHLORO-2-BUTENE									
TRICHLOROETHENE									
TRICHLOROFLUOROMETHANE									
VINYL CHLORIDE									

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS102A		DASB102		DASB102A
SAMPLE ID	DASS102A-0002-	DASS102A-0002-D	DASB102-0305	DASB102A-0406	DASB102A-0406-AVG
SAMPLE DATE	20110525	20110525	20100420	20110525	20110525
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SB	SB	SB
TOP DEPTH	0	0	3	4	4
BOTTOM DEPTH	2	2	5	6	6
METALS (MG/KG)					
ARSENIC			16		
BARIUM			82		
CADMIUM			0.21		
CHROMIUM			14 J		
COPPER			37		
LEAD			140		
MERCURY	0.0675	0.082		0.32	0.305
SELENIUM			0.33		
SILVER			0.098		
ZINC			90		
MISCELLANEOUS PARAMETERS (%)					
PERCENT MOISTURE					
PERCENT SOLIDS	87	87		88	86.5
TOTAL SOLIDS			86		
PESTICIDES/PCBS (UG/KG)					
4,4'-DDD					
4,4'-DDE					
4,4'-DDT					
ALDRIN					
ALPHA-BHC					
ALPHA-CHLORDANE					
AROCLOR-1016					
AROCLOR-1221					
AROCLOR-1232					
AROCLOR-1242					
AROCLOR-1248					
AROCLOR-1254					
AROCLOR-1260					
BETA-BHC					
CHLORDANE (TECHNICAL)					
DELTA-BHC					
DIELDRIN					
ENDOSULFAN I					
ENDOSULFAN II					
ENDOSULFAN SULFATE					
ENDRIN					
ENDRIN ALDEHYDE					
ENDRIN KETONE					
GAMMA-BHC (LINDANE)					
GAMMA-CHLORDANE					
HEPTACHLOR					
HEPTACHLOR EPOXIDE					
METHOXYCHLOR					
TOXAPHENE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS102A		DASB102		DASB102A
SAMPLE ID	DASS102A-0002-AVG	DASS102A-0002-D DUP	DASB102-0305	DASB102A-0406 ORIG	DASB102A-0406-AVG
SAMPLE DATE	20110525	20110525	20100420	20110525	20110525
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SB	SB	SB
TOP DEPTH	0	0	3	4	4
BOTTOM DEPTH	2	2	5	6	6
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
2-METHYLNAPHTHALENE	141	12 J		1800	1900
ACENAPHTHENE	83	46 J		380	445
ACENAPHTHYLENE	190 U	190 U		130 J	155
ANTHRACENE	175	100 J		450 J	725
BAP EQUIVALENT-HALFND	541.635	454.89		971.89	1553.645
BAP EQUIVALENT-POS	446.635	359.89		876.89	1506.145
BENZO(A)ANTHRACENE	430	320 J		990 J	1545
BENZO(A)PYRENE	340	280		660 J	1030
BENZO(B)FLUORANTHENE	445	310 J		860 J	1480
BENZO(G,H,I)PERYLENE	185	150 J		300 J	465
BENZO(K)FLUORANTHENE	170	160 J		400 J	670
CHRYSENE	435	290 J		890 J	1445
DIBENZO(A,H)ANTHRACENE	190 U	190 U		190 U	167.5
FLUORANTHENE	800	600		1700 J	2800
FLUORENE	133	46 J		920	1110
INDENO(1,2,3-CD)PYRENE	170	150 J		270 J	455
NAPHTHALENE	113.5	27 J		1700	1600
PHENANTHRENE	815	430 J		3200 J	4650
PYRENE	765	560 J		2000 J	2950
SEMIVOLATILES (UG/KG)					
1,2,4-TRICHLOROBENZENE					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
2,2'-OXYBIS(1-CHLOROPROPANE)					
2,4,5-TRICHLOROPHENOL					
2,4,6-TRICHLOROPHENOL					
2,4-DICHLOROPHENOL					
2,4-DIMETHYLPHENOL					
2,4-DINITROPHENOL					
2,4-DINITROTOLUENE					
2,6-DINITROTOLUENE					
2-CHLORONAPHTHALENE					
2-CHLOROPHENOL					
2-METHYLNAPHTHALENE					
2-METHYLPHENOL					
2-NITROANILINE					
2-NITROPHENOL					
3&4-METHYLPHENOL					
3,3'-DICHLOROBENZIDINE					
3-NITROANILINE					
4,6-DINITRO-2-METHYLPHENOL					
4-BROMOPHENYL PHENYL ETHER					
4-CHLORO-3-METHYLPHENOL					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS102A		DASB102		DASB102A
SAMPLE ID	DASS102A-0002-AVG	DASS102A-0002-D	DASB102-0305	DASB102A-0406	DASB102A-0406-AVG
SAMPLE DATE	20110525	20110525	20100420	20110525	20110525
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SB	SB	SB
TOP DEPTH	0	0	3	4	4
BOTTOM DEPTH	2	2	5	6	6
4-CHLOROANILINE					
4-CHLOROPHENYL PHENYL ETHER					
4-NITROANILINE					
4-NITROPHENOL					
ACENAPHTHENE					
ACENAPHTHYLENE					
ANTHRACENE					
BAP EQUIVALENT-HALFND					
BAP EQUIVALENT-POS					
BENZO(A)ANTHRACENE					
BENZO(A)PYRENE					
BENZO(B)FLUORANTHENE					
BENZO(G,H,I)PERYLENE					
BENZO(K)FLUORANTHENE					
BIS(2-CHLOROETHOXY)METHANE					
BIS(2-CHLOROETHYL)ETHER					
BIS(2-ETHYLHEXYL)PHTHALATE					
BUTYL BENZYL PHTHALATE					
CARBAZOLE					
CHRYSENE					
DIBENZO(A,H)ANTHRACENE					
DIBENZOFURAN					
DIETHYL PHTHALATE					
DIMETHYL PHTHALATE					
DI-N-BUTYL PHTHALATE					
DI-N-OCTYL PHTHALATE					
FLUORANTHENE					
FLUORENE					
HEXACHLOROBENZENE					
HEXACHLOROBUTADIENE					
HEXACHLOROCYCLOPENTADIENE					
HEXACHLOROETHANE					
INDENO(1,2,3-CD)PYRENE					
ISOPHORONE					
NAPHTHALENE					
NITROBENZENE					
N-NITROSO-DI-N-PROPYLAMINE					
N-NITROSODIPHENYLAMINE					
PENTACHLOROPHENOL					
PHENANTHRENE					
PHENOL					
PYRENE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS102A		DASB102		DASB102A
SAMPLE ID	DASS102A-0002-20110525	DASS102A-0002-D 20110525	DASB102-0305 20100420	DASB102A-0406 20110525	DASB102A-0406-AVG 20110525
SAMPLE DATE	AVG	DUP	NORMAL	ORIG	AVG
SAMPLE CODE	SO	SO	SO	SO	SO
MATRIX	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SAMPLE TYPE	SS	SS	SB	SB	SB
SUBMATRIX	0	0	3	4	4
TOP DEPTH	2	2	5	6	6
BOTTOM DEPTH					
VOLATILES (UG/KG)					
1,1,1,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,2-TRICHLOROETHANE					
1,1,2-TRICHLOROTRIFLUOROETHANE					
1,1-DICHLOROETHANE					
1,1-DICHLOROETHENE					
1,1-DICHLOROPROPENE					
1,2,3-TRICHLOROBENZENE					
1,2,3-TRICHLOROPROPANE					
1,2,3-TRIMETHYLBENZENE					
1,2,4-TRICHLOROBENZENE					
1,2,4-TRIMETHYLBENZENE					
1,2-DIBROMO-3-CHLOROPROPANE					
1,2-DIBROMOETHANE					
1,2-DICHLOROBENZENE					
1,2-DICHLOROETHANE					
1,2-DICHLOROPROPANE					
1,3,5-TRIMETHYLBENZENE					
1,3-DICHLOROBENZENE					
1,3-DICHLOROPROPANE					
1,4-DICHLOROBENZENE					
2,2-DICHLOROPROPANE					
2-BUTANONE					
2-CHLOROETHYL VINYL ETHER					
2-CHLOROTOLUENE					
2-HEXANONE					
2-METHYLNAPHTHALENE					
2-NITROPROPANE					
4-CHLOROTOLUENE					
4-ISOPROPYLTOLUENE					
4-METHYL-2-PENTANONE					
ACETONE					
ACRYLONITRILE					
BENZENE					
BROMOBENZENE					
BROMOCHLOROMETHANE					
BROMODICHLOROMETHANE					
BROMOFORM					
BROMOMETHANE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROBENZENE					
CHLORODIBROMOMETHANE					
CHLOROETHANE					
CHLOROFORM					
CHLOROMETHANE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS102A		DASB102		DASB102A
SAMPLE ID	DASS102A-0002-	DASS102A-0002-D	DASB102-0305	DASB102A-0406	DASB102A-0406-AVG
SAMPLE DATE	20110525	20110525	20100420	20110525	20110525
SAMPLE CODE	AVG	DUP	NORMAL	ORIG	AVG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SB	SB	SB
TOP DEPTH	0	0	3	4	4
BOTTOM DEPTH	2	2	5	6	6
CIS-1,2-DICHLOROETHENE					
CIS-1,3-DICHLOROPROPENE					
DIBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
DIETHYL ETHER					
DIISOPROPYL ETHER					
ETHYL METHACRYLATE					
ETHYL TERT-BUTYL ETHER					
ETHYLBENZENE					
HEXACHLOROBUTADIENE					
HEXACHLOROETHANE					
ISOPROPYLBENZENE					
M+P-XYLENES					
METHYL IODIDE					
METHYL TERT-BUTYL ETHER					
METHYLENE CHLORIDE					
NAPHTHALENE					
N-BUTYLBENZENE					
N-PROPYLBENZENE					
O-XYLENE					
SEC-BUTYLBENZENE					
STYRENE					
TERT-AMYL METHYL ETHER					
TERT-BUTYLBENZENE					
TERTIARY-BUTYL ALCOHOL					
TETRACHLOROETHENE					
TOLUENE					
TOTAL XYLENES					
TRANS-1,2-DICHLOROETHENE					
TRANS-1,3-DICHLOROPROPENE					
TRANS-1,4-DICHLORO-2-BUTENE					
TRICHLOROETHENE					
TRICHLOROFLUOROMETHANE					
VINYL CHLORIDE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION		DASS103	DASB103	DASS104	DASS104A	DASB104	DASB104A
SAMPLE ID	DASB102A-0406-D	DASS103-0002	DASB103-0305	DASS104-0002	DASS104A-0002	DASB104-0305	DASB104A-0204
SAMPLE DATE	20110525	20100421	20100421	20100420	20110525	20100420	20110525
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SB	SB
TOP DEPTH	4	0	3	0	0	3	2
BOTTOM DEPTH	6	2	5	2	2	5	4
METALS (MG/KG)							
ARSENIC		6.8	5	11		6.4	
BARIUM		49	36	110		47	
CADMIUM		0.18	0.19	0.79		0.17	
CHROMIUM		13	13	18 J		16 J	
COPPER		14	13	79		14	
LEAD		43	12	360		16	
MERCURY	0.29	0.044 J	0.031 J		0.19		0.15
SELENIUM		0.25	0.36	0.5		0.25	
SILVER		0.085	0.074	0.15		0.076	
ZINC		45	39	270		56	
MISCELLANEOUS PARAMETERS (%)							
PERCENT MOISTURE							
PERCENT SOLIDS	85				88		85
TOTAL SOLIDS		92	87	85		86	
PESTICIDES/PCBS (UG/KG)							
4,4'-DDD							
4,4'-DDE							
4,4'-DDT							
ALDRIN							
ALPHA-BHC							
ALPHA-CHLORDANE							
AROCLOR-1016							
AROCLOR-1221							
AROCLOR-1232							
AROCLOR-1242							
AROCLOR-1248							
AROCLOR-1254							
AROCLOR-1260							
BETA-BHC							
CHLORDANE (TECHNICAL)							
DELTA-BHC							
DIELDRIN							
ENDOSULFAN I							
ENDOSULFAN II							
ENDOSULFAN SULFATE							
ENDRIN							
ENDRIN ALDEHYDE							
ENDRIN KETONE							
GAMMA-BHC (LINDANE)							
GAMMA-CHLORDANE							
HEPTACHLOR							
HEPTACHLOR EPOXIDE							
METHOXYCHLOR							
TOXAPHENE							

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION		DASS103	DASB103	DASS104	DASS104A	DASB104	DASB104A
SAMPLE ID	DASB102A-0406-D	DASS103-0002	DASB103-0305	DASS104-0002	DASS104A-0002	DASB104-0305	DASB104A-0204
SAMPLE DATE	20110525	20100421	20100421	20100420	20110525	20100420	20110525
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SB	SB
TOP DEPTH	4	0	3	0	0	3	2
BOTTOM DEPTH	6	2	5	2	2	5	4
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
2-METHYLNAPHTHALENE	2000	3.1 J	19 U		190 U		28 J
ACENAPHTHENE	510	8 J	19 U		49 J		120 J
ACENAPHTHYLENE	180 J	8.8 J	19 U		49 J		200 U
ANTHRACENE	1000 J	29	5.8 J		220		230
BAP EQUIVALENT-HALFND	2135.4	217.18	30.473		1628		633.46
BAP EQUIVALENT-POS	2135.4	217.18	20.973		1533		533.46
BENZO(A)ANTHRACENE	2100 J	160	11 J		1400		520
BENZO(A)PYRENE	1400 J	140	17 J		1200		410
BENZO(B)FLUORANTHENE	2100 J	210	19		1300		520
BENZO(G,H,I)PERYLENE	630 J	92	13 J		510		190 J
BENZO(K)FLUORANTHENE	940 J	71	8 J		690		200
CHRYSENE	2000 J	170	13 J		1100		460
DIBENZO(A,H)ANTHRACENE	240	31	19 U		190 U		200 U
FLUORANTHENE	3900 J	320	24		1900		1000
FLUORENE	1300	11 J	1.9 J		46 J		110 J
INDENO(1,2,3-CD)PYRENE	640 J	83	8.8 J		550		170 J
NAPHTHALENE	1500	2.4 J	1.6 J		23 J		28 J
PHENANTHRENE	6100 J	180	18 J		680		830
PYRENE	3900 J	280	24		2100		900
SEMIVOLATILES (UG/KG)							
1,2,4-TRICHLOROBENZENE							
1,2-DICHLOROBENZENE							
1,3-DICHLOROBENZENE							
1,4-DICHLOROBENZENE							
2,2'-OXYBIS(1-CHLOROPROPANE)							
2,4,5-TRICHLOROPHENOL							
2,4,6-TRICHLOROPHENOL							
2,4-DICHLOROPHENOL							
2,4-DIMETHYLPHENOL							
2,4-DINITROPHENOL							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							
2-CHLORONAPHTHALENE							
2-CHLOROPHENOL							
2-METHYLNAPHTHALENE							
2-METHYLPHENOL							
2-NITROANILINE							
2-NITROPHENOL							
3&4-METHYLPHENOL							
3,3'-DICHLOROBENZIDINE							
3-NITROANILINE							
4,6-DINITRO-2-METHYLPHENOL							
4-BROMOPHENYL PHENYL ETHER							
4-CHLORO-3-METHYLPHENOL							

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION		DASS103	DASB103	DASS104	DASS104A	DASB104	DASB104A
SAMPLE ID	DASB102A-0406-D	DASS103-0002	DASB103-0305	DASS104-0002	DASS104A-0002	DASB104-0305	DASB104A-0204
SAMPLE DATE	20110525	20100421	20100421	20100420	20110525	20100420	20110525
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SB	SB
TOP DEPTH	4	0	3	0	0	3	2
BOTTOM DEPTH	6	2	5	2	2	5	4
4-CHLOROANILINE							
4-CHLOROPHENYL PHENYL ETHER							
4-NITROANILINE							
4-NITROPHENOL							
ACENAPHTHENE							
ACENAPHTHYLENE							
ANTHRACENE							
BAP EQUIVALENT-HALFND							
BAP EQUIVALENT-POS							
BENZO(A)ANTHRACENE							
BENZO(A)PYRENE							
BENZO(B)FLUORANTHENE							
BENZO(G,H,I)PERYLENE							
BENZO(K)FLUORANTHENE							
BIS(2-CHLORDETHOXY)METHANE							
BIS(2-CHLOROETHYL)ETHER							
BIS(2-ETHYLHEXYL)PHTHALATE							
BUTYL BENZYL PHTHALATE							
CARBAZOLE							
CHRYSENE							
DIBENZO(A,H)ANTHRACENE							
DIBENZOFURAN							
DIETHYL PHTHALATE							
DIMETHYL PHTHALATE							
DI-N-BUTYL PHTHALATE							
DI-N-OCTYL PHTHALATE							
FLUORANTHENE							
FLUORENE							
HEXACHLOROBENZENE							
HEXACHLOROBUTADIENE							
HEXACHLOROCYCLOPENTADIENE							
HEXACHLOROETHANE							
INDENO(1,2,3-CD)PYRENE							
ISOPHORONE							
NAPHTHALENE							
NITROBENZENE							
N-NITROSO-DI-N-PROPYLAMINE							
N-NITROSODIPHENYLAMINE							
PENTACHLOROPHENOL							
PHENANTHRENE							
PHENOL							
PYRENE							

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION		DASS103	DASB103	DASS104	DASS104A	DASB104	DASB104A
SAMPLE ID	DASB102A-0406-D	DASS103-0002	DASB103-0305	DASS104-0002	DASS104A-0002	DASB104-0305	DASB104A-0204
SAMPLE DATE	20110525	20100421	20100421	20100420	20110525	20100420	20110525
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SB	SB
TOP DEPTH	4	0	3	0	0	3	2
BOTTOM DEPTH	6	2	5	2	2	5	4
VOLATILES (UG/KG)							
1,1,1,2-TETRACHLOROETHANE							
1,1,1-TRICHLOROETHANE							
1,1,2,2-TETRACHLOROETHANE							
1,1,2-TRICHLOROETHANE							
1,1,2-TRICHLOROTRIFLUOROETHANE							
1,1-DICHLOROETHANE							
1,1-DICHLOROETHENE							
1,1-DICHLOROPROPENE							
1,2,3-TRICHLOROBENZENE							
1,2,3-TRICHLOROPROPANE							
1,2,3-TRIMETHYLBENZENE							
1,2,4-TRICHLOROBENZENE							
1,2,4-TRIMETHYLBENZENE							
1,2-DIBROMO-3-CHLOROPROPANE							
1,2-DIBROMOETHANE							
1,2-DICHLOROBENZENE							
1,2-DICHLOROETHANE							
1,2-DICHLOROPROPANE							
1,3,5-TRIMETHYLBENZENE							
1,3-DICHLOROBENZENE							
1,3-DICHLOROPROPANE							
1,4-DICHLOROBENZENE							
2,2-DICHLOROPROPANE							
2-BUTANONE							
2-CHLOROETHYL VINYL ETHER							
2-CHLOROTOLUENE							
2-HEXANONE							
2-METHYLNAPHTHALENE							
2-NITROPROPANE							
4-CHLOROTOLUENE							
4-ISOPROPYLTOLUENE							
4-METHYL-2-PENTANONE							
ACETONE							
ACRYLONITRILE							
BENZENE							
BROMOBENZENE							
BROMOCHLOROMETHANE							
BROMODICHLOROMETHANE							
BROMOFORM							
BROMOMETHANE							
CARBON DISULFIDE							
CARBON TETRACHLORIDE							
CHLOROBENZENE							
CHLORODIBROMOMETHANE							
CHLOROETHANE							
CHLOROFORM							
CHLOROMETHANE							

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION		DASS103	DASB103	DASS104	DASS104A	DASB104	DASB104A
SAMPLE ID	DASB102A-0406-D	DASS103-0002	DASB103-0305	DASS104-0002	DASS104A-0002	DASB104-0305	DASB104A-0204
SAMPLE DATE	20110525	20100421	20100421	20100420	20110525	20100420	20110525
SAMPLE CODE	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SB	SB
TOP DEPTH	4	0	3	0	0	3	2
BOTTOM DEPTH	6	2	5	2	2	5	4
CIS-1,2-DICHLOROETHENE							
CIS-1,3-DICHLOROPROPENE							
DIBROMOMETHANE							
DICHLORODIFLUOROMETHANE							
DIETHYL ETHER							
DIISOPROPYL ETHER							
ETHYL METHACRYLATE							
ETHYL TERT-BUTYL ETHER							
ETHYLBENZENE							
HEXACHLOROBUTADIENE							
HEXACHLOROETHANE							
ISOPROPYLBENZENE							
M+P-XYLENES							
METHYL IODIDE							
METHYL TERT-BUTYL ETHER							
METHYLENE CHLORIDE							
NAPHTHALENE							
N-BUTYLBENZENE							
N-PROPYLBENZENE							
O-XYLENE							
SEC-BUTYLBENZENE							
STYRENE							
TERT-AMYL METHYL ETHER							
TERT-BUTYLBENZENE							
TERTIARY-BUTYL ALCOHOL							
TETRACHLOROETHENE							
TOLUENE							
TOTAL XYLENES							
TRANS-1,2-DICHLOROETHENE							
TRANS-1,3-DICHLOROPROPENE							
TRANS-1,4-DICHLORO-2-BUTENE							
TRICHLOROETHENE							
TRICHLOROFLUOROMETHANE							
VINYL CHLORIDE							

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS105	DASB105	DASS106	DASS106A	DASB106
SAMPLE ID	DASS105-0002	DASB105-0305	DASS106-0002	DASS106A-0002	DASB106-0305
SAMPLE DATE	20100421	20100421	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SS	SS	SB
TOP DEPTH	0	3	0	0	3
BOTTOM DEPTH	2	5	2	2	5
METALS (MG/KG)					
ARSENIC	6.6	8.8	6.4		5.5
BARIUM	74	66	75		48
CADMIUM	0.3	0.24	0.33		0.13
CHROMIUM	17	14	14 J		15 J
COPPER	29	60	49		13
LEAD	85	93	99		8.5
MERCURY	0.24	0.16		0.043 J	
SELENIUM	0.18	0.34	0.78		0.1 U
SILVER	0.1	0.12	0.11		0.069
ZINC	87	79	88		38
MISCELLANEOUS PARAMETERS (%)					
PERCENT MOISTURE					
PERCENT SOLIDS				84	
TOTAL SOLIDS	88	85	87		92
PESTICIDES/PCBS (UG/KG)					
4,4'-DDD					
4,4'-DDE					
4,4'-DDT					
ALDRIN					
ALPHA-BHC					
ALPHA-CHLORDANE					
AROCLOR-1016					
AROCLOR-1221					
AROCLOR-1232					
AROCLOR-1242					
AROCLOR-1248					
AROCLOR-1254					
AROCLOR-1260					
BETA-BHC					
CHLORDANE (TECHNICAL)					
DELTA-BHC					
DIELDRIN					
ENDOSULFAN I					
ENDOSULFAN II					
ENDOSULFAN SULFATE					
ENDRIN					
ENDRIN ALDEHYDE					
ENDRIN KETONE					
GAMMA-BHC (LINDANE)					
GAMMA-CHLORDANE					
HEPTACHLOR					
HEPTACHLOR EPOXIDE					
METHOXYCHLOR					
TOXAPHENE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS105	DASB105	DASS106	DASS106A	DASB106
SAMPLE ID	DASS105-0002	DASB105-0305	DASS106-0002	DASS106A-0002	DASB106-0305
SAMPLE DATE	20100421	20100421	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SS	SS	SB
TOP DEPTH	0	3	0	0	3
BOTTOM DEPTH	2	5	2	2	5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
2-METHYLNAPHTHALENE	4300	27 J		200 U	
ACENAPHTHENE	980	19 J		200 U	
ACENAPHTHYLENE	730 J	7.4 J		200 U	
ANTHRACENE	2100	76 J		140 J	
BAP EQUIVALENT-HALFND	4211.8	296.17		482.75	
BAP EQUIVALENT-POS	3736.8	296.17		382.75	
BENZO(A)ANTHRACENE	3700	220		400	
BENZO(A)PYRENE	2900	200		290	
BENZO(B)FLUORANTHENE	3200	250		390	
BENZO(G,H,I)PERYLENE	1500	110		120 J	
BENZO(K)FLUORANTHENE	2300	96 J		140 J	
CHRYSENE	3800	210		350	
DIBENZO(A,H)ANTHRACENE	950 U	37 J		200 U	
FLUORANTHENE	8400	420		740	
FLUORENE	2200	37 J		200 U	
INDENO(1,2,3-CD)PYRENE	1200	110		120 J	
NAPHTHALENE	3000	27 J		200 U	
PHENANTHRENE	13000	430		480	
PYRENE	8200	430		760	
SEMIVOLATILES (UG/KG)					
1,2,4-TRICHLOROBENZENE					
1,2-DICHLOROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
2,2'-OXYBIS(1-CHLOROPROPANE)					
2,4,5-TRICHLOROPHENOL					
2,4,6-TRICHLOROPHENOL					
2,4-DICHLOROPHENOL					
2,4-DIMETHYLPHENOL					
2,4-DINITROPHENOL					
2,4-DINITROTOLUENE					
2,6-DINITROTOLUENE					
2-CHLORONAPHTHALENE					
2-CHLOROPHENOL					
2-METHYLNAPHTHALENE					
2-METHYLPHENOL					
2-NITROANILINE					
2-NITROPHENOL					
3&4-METHYLPHENOL					
3,3'-DICHLOROBENZIDINE					
3-NITROANILINE					
4,6-DINITRO-2-METHYLPHENOL					
4-BROMOPHENYL PHENYL ETHER					
4-CHLORO-3-METHYLPHENOL					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS105	DASB105	DASS106	DASS106A	DASB106
SAMPLE ID	DASS105-0002	DASB105-0305	DASS106-0002	DASS106A-0002	DASB106-0305
SAMPLE DATE	20100421	20100421	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SS	SS	SB
TOP DEPTH	0	3	0	0	3
BOTTOM DEPTH	2	5	2	2	5
4-CHLOROANILINE					
4-CHLOROPHENYL PHENYL ETHER					
4-NITROANILINE					
4-NITROPHENOL					
ACENAPHTHENE					
ACENAPHTHYLENE					
ANTHRACENE					
BAP EQUIVALENT-HALFND					
BAP EQUIVALENT-POS					
BENZO(A)ANTHRACENE					
BENZO(A)PYRENE					
BENZO(B)FLUORANTHENE					
BENZO(G,H,I)PERYLENE					
BENZO(K)FLUORANTHENE					
BIS(2-CHLOROETHOXY)METHANE					
BIS(2-CHLOROETHYL)ETHER					
BIS(2-ETHYLHEXYL)PHTHALATE					
BUTYL BENZYL PHTHALATE					
CARBAZOLE					
CHRYSENE					
DIBENZO(A,H)ANTHRACENE					
DIBENZOFURAN					
DIETHYL PHTHALATE					
DIMETHYL PHTHALATE					
DI-N-BUTYL PHTHALATE					
DI-N-OCTYL PHTHALATE					
FLUORANTHENE					
FLUORENE					
HEXACHLOROBENZENE					
HEXACHLOROBUTADIENE					
HEXACHLOROCYCLOPENTADIENE					
HEXACHLOROETHANE					
INDENO(1,2,3-CD)PYRENE					
ISOPHORONE					
NAPHTHALENE					
NITROBENZENE					
N-NITROSO-DI-N-PROPYLAMINE					
N-NITROSODIPHENYLAMINE					
PENTACHLOROPHENOL					
PHENANTHRENE					
PHENOL					
PYRENE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS105	DASB105	DASS106	DASS106A	DASB106
SAMPLE ID	DASS105-0002	DASB105-0305	DASS106-0002	DASS106A-0002	DASB106-0305
SAMPLE DATE	20100421	20100421	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SS	SS	SB
TOP DEPTH	0	3	0	0	3
BOTTOM DEPTH	2	5	2	2	5
VOLATILES (UG/KG)					
1,1,1,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE					
1,1,2,2-TETRACHLOROETHANE					
1,1,2-TRICHLOROETHANE					
1,1,2-TRICHLOROTRIFLUOROETHANE					
1,1-DICHLOROETHANE					
1,1-DICHLOROETHENE					
1,1-DICHLOROPROPENE					
1,2,3-TRICHLOROBENZENE					
1,2,3-TRICHLOROPROPANE					
1,2,3-TRIMETHYLBENZENE					
1,2,4-TRICHLOROBENZENE					
1,2,4-TRIMETHYLBENZENE					
1,2-DIBROMO-3-CHLOROPROPANE					
1,2-DIBROMOETHANE					
1,2-DICHLOROBENZENE					
1,2-DICHLOROETHANE					
1,2-DICHLOROPROPANE					
1,3,5-TRIMETHYLBENZENE					
1,3-DICHLOROBENZENE					
1,3-DICHLOROPROPANE					
1,4-DICHLOROBENZENE					
2,2-DICHLOROPROPANE					
2-BUTANONE					
2-CHLOROETHYL VINYL ETHER					
2-CHLOROTOLUENE					
2-HEXANONE					
2-METHYLNAPHTHALENE					
2-NITROPROPANE					
4-CHLOROTOLUENE					
4-ISOPROPYLTOLUENE					
4-METHYL-2-PENTANONE					
ACETONE					
ACRYLONITRILE					
BENZENE					
BROMOBENZENE					
BROMOCHLOROMETHANE					
BROMODICHLOROMETHANE					
BROMOFORM					
BROMOMETHANE					
CARBON DISULFIDE					
CARBON TETRACHLORIDE					
CHLOROBENZENE					
CHLORODIBROMOMETHANE					
CHLOROETHANE					
CHLOROFORM					
CHLOROMETHANE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS105	DASB105	DASS106	DASS106A	DASB106
SAMPLE ID	DASS105-0002	DASB105-0305	DASS106-0002	DASS106A-0002	DASB106-0305
SAMPLE DATE	20100421	20100421	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SS	SS	SB
TOP DEPTH	0	3	0	0	3
BOTTOM DEPTH	2	5	2	2	5
CIS-1,2-DICHLOROETHENE					
CIS-1,3-DICHLOROPROPENE					
DIBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
DIETHYL ETHER					
DIISOPROPYL ETHER					
ETHYL METHACRYLATE					
ETHYL TERT-BUTYL ETHER					
ETHYLBENZENE					
HEXACHLOROBUTADIENE					
HEXACHLOROETHANE					
ISOPROPYLBENZENE					
M+P-XYLENES					
METHYL IODIDE					
METHYL TERT-BUTYL ETHER					
METHYLENE CHLORIDE					
NAPHTHALENE					
N-BUTYLBENZENE					
N-PROPYLBENZENE					
O-XYLENE					
SEC-BUTYLBENZENE					
STYRENE					
TERT-AMYL METHYL ETHER					
TERT-BUTYLBENZENE					
TERTIARY-BUTYL ALCOHOL					
TETRACHLOROETHENE					
TOLUENE					
TOTAL XYLENES					
TRANS-1,2-DICHLOROETHENE					
TRANS-1,3-DICHLOROPROPENE					
TRANS-1,4-DICHLORO-2-BUTENE					
TRICHLOROETHENE					
TRICHLOROFLUOROMETHANE					
VINYL CHLORIDE					

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB106A	DASS107	DASB107	DASS108	DASB108	
SAMPLE ID	DASB106A-0204	DASS107-0002	DASB107-0204	DASS108-0002	DASB108-0305	DASS109-0002
SAMPLE DATE	20110525	20100421	20100421	20100421	20100421	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SB	SS
TOP DEPTH	2	0	2	0	3	0
BOTTOM DEPTH	4	2	4	2	5	2
METALS (MG/KG)						
ARSENIC		8.7	9.4	2.5	3.3	9.2
BARIUM		65	74	26	73	150
CADMIUM		0.57	0.46	0.16	0.15	0.45
CHROMIUM		16	13	10	12	12 J
COPPER		130	98	8.7	12	71
LEAD		190	130	11	53	450
MERCURY	0.49	0.11	0.27	0.018 J	0.28	
SELENIUM		0.32	0.36	0.1 U	0.17	0.59
SILVER		0.078	0.14	0.045 J	0.064	0.13
ZINC		130	160	31	46	200
MISCELLANEOUS PARAMETERS (%)						
PERCENT MOISTURE						
PERCENT SOLIDS	86					
TOTAL SOLIDS		89	90	93	83	92
PESTICIDES/PCBS (UG/KG)						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT						
ALDRIN						
ALPHA-BHC						
ALPHA-CHLORDANE						
AROCLOR-1016						
AROCLOR-1221						
AROCLOR-1232						
AROCLOR-1242						
AROCLOR-1248						
AROCLOR-1254						
AROCLOR-1260						
BETA-BHC						
CHLORDANE (TECHNICAL)						
DELTA-BHC						
DIELDRIN						
ENDOSULFAN I						
ENDOSULFAN II						
ENDOSULFAN SULFATE						
ENDRIN						
ENDRIN ALDEHYDE						
ENDRIN KETONE						
GAMMA-BHC (LINDANE)						
GAMMA-CHLORDANE						
HEPTACHLOR						
HEPTACHLOR EPOXIDE						
METHOXYCHLOR						
TOXAPHENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB106A	DASS107	DASB107	DASS108	DASB108	
SAMPLE ID	DASB106A-0204	DASS107-0002	DASB107-0204	DASS108-0002	DASB108-0305	DASS109-0002
SAMPLE DATE	20110525	20100421	20100421	20100421	20100421	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SB	SS
TOP DEPTH	2	0	2	0	3	0
BOTTOM DEPTH	4	2	4	2	5	2
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
2-METHYLNAPHTHALENE	92 J	15 J	220	36 U	20 U	
ACENAPHTHENE	290	20 J	440	36 U	20 U	
ACENAPHTHYLENE	96 J	22 J	110	3.3 J	20 U	
ANTHRACENE	580	82 J	840	13 J	4.4 J	
BAP EQUIVALENT-HALFND	3306.8	334.84	2427.8	101.303	27.548	
BAP EQUIVALENT-POS	3306.8	334.84	2427.8	83.303	17.548	
BENZO(A)ANTHRACENE	3000	300	2600	57	13 J	
BENZO(A)PYRENE	2200	230	1600	67	13 J	
BENZO(B)FLUORANTHENE	3000	360 J	1900	65	23	
BENZO(G,H,I)PERYLENE	780	140	830	44	10 J	
BENZO(K)FLUORANTHENE	1200	57 J	1200	45	6.5 J	
CHRYSENE	2800	270	2800	53	13 J	
DIBENZO(A,H)ANTHRACENE	400	21 J	290	36 U	20 U	
FLUORANTHENE	4300	500	4300	81	24	
FLUORENE	330	26 J	430	3.8 J	20 U	
INDENO(1,2,3-CD)PYRENE	920	170	730	36	8.7 J	
NAPHTHALENE	160 J	10 J	220	36 U	20 U	
PHENANTHRENE	2500	310	2800	51	12 J	
PYRENE	4400	530	3300	76	24	
SEMIVOLATILES (UG/KG)						
1,2,4-TRICHLOROBENZENE						
1,2-DICHLOROBENZENE						
1,3-DICHLOROBENZENE						
1,4-DICHLOROBENZENE						
2,2'-OXYBIS(1-CHLOROPROPANE)						
2,4,5-TRICHLOROPHENOL						
2,4,6-TRICHLOROPHENOL						
2,4-DICHLOROPHENOL						
2,4-DIMETHYLPHENOL						
2,4-DINITROPHENOL						
2,4-DINITROTOLUENE						
2,6-DINITROTOLUENE						
2-CHLORONAPHTHALENE						
2-CHLOROPHENOL						
2-METHYLNAPHTHALENE						
2-METHYLPHENOL						
2-NITROANILINE						
2-NITROPHENOL						
3&4-METHYLPHENOL						
3,3'-DICHLOROBENZIDINE						
3-NITROANILINE						
4,6-DINITRO-2-METHYLPHENOL						
4-BROMOPHENYL PHENYL ETHER						
4-CHLORO-3-METHYLPHENOL						

LOCATION	DASB106A	DASS107	DASB107	DASS108	DASB108	
SAMPLE ID	DASB106A-0204	DASS107-0002	DASB107-0204	DASS108-0002	DASB108-0305	DASS109-0002
SAMPLE DATE	20110525	20100421	20100421	20100421	20100421	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SB	SS
TOP DEPTH	2	0	2	0	3	0
BOTTOM DEPTH	4	2	4	2	5	2
4-CHLOROANILINE						
4-CHLOROPHENYL PHENYL ETHER						
4-NITROANILINE						
4-NITROPHENOL						
ACENAPHTHENE						
ACENAPHTHYLENE						
ANTHRACENE						
BAP EQUIVALENT-HALFND						
BAP EQUIVALENT-POS						
BENZO(A)ANTHRACENE						
BENZO(A)PYRENE						
BENZO(B)FLUORANTHENE						
BENZO(G,H,I)PERYLENE						
BENZO(K)FLUORANTHENE						
BIS(2-CHLOROETHOXY)METHANE						
BIS(2-CHLOROETHYL)ETHER						
BIS(2-ETHYLHEXYL)PHTHALATE						
BUTYL BENZYL PHTHALATE						
CARBAZOLE						
CHRYSENE						
DIBENZO(A,H)ANTHRACENE						
DIBENZOFURAN						
DIETHYL PHTHALATE						
DIMETHYL PHTHALATE						
DI-N-BUTYL PHTHALATE						
DI-N-OCTYL PHTHALATE						
FLUORANTHENE						
FLUORENE						
HEXACHLOROBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROCYCLOPENTADIENE						
HEXACHLOROETHANE						
INDENO(1,2,3-CD)PYRENE						
ISOPHORONE						
NAPHTHALENE						
NITROBENZENE						
N-NITROSO-DI-N-PROPYLAMINE						
N-NITROSODIPHENYLAMINE						
PENTACHLOROPHENOL						
PHENANTHRENE						
PHENOL						
PYRENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB106A	DASS107	DASB107	DASS108	DASB108	
SAMPLE ID	DASB106A-0204	DASS107-0002	DASB107-0204	DASS108-0002	DASB108-0305	DASS109-0002
SAMPLE DATE	20110525	20100421	20100421	20100421	20100421	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SB	SS
TOP DEPTH	2	0	2	0	3	0
BOTTOM DEPTH	4	2	4	2	5	2
VOLATILES (UG/KG)						
1,1,1,2-TETRACHLOROETHANE						
1,1,1-TRICHLOROETHANE						
1,1,2,2-TETRACHLOROETHANE						
1,1,2-TRICHLOROETHANE						
1,1,2-TRICHLOROTRIFLUOROETHANE						
1,1-DICHLOROETHANE						
1,1-DICHLOROETHENE						
1,1-DICHLOROPROPENE						
1,2,3-TRICHLOROBENZENE						
1,2,3-TRICHLOROPROPANE						
1,2,3-TRIMETHYLBENZENE						
1,2,4-TRICHLOROBENZENE						
1,2,4-TRIMETHYLBENZENE						
1,2-DIBROMO-3-CHLOROPROPANE						
1,2-DIBROMOETHANE						
1,2-DICHLOROBENZENE						
1,2-DICHLOROETHANE						
1,2-DICHLOROPROPANE						
1,3,5-TRIMETHYLBENZENE						
1,3-DICHLOROBENZENE						
1,3-DICHLOROPROPANE						
1,4-DICHLOROBENZENE						
2,2-DICHLOROPROPANE						
2-BUTANONE						
2-CHLOROETHYL VINYL ETHER						
2-CHLOROTOLUENE						
2-HEXANONE						
2-METHYLNAPHTHALENE						
2-NITROPROPANE						
4-CHLOROTOLUENE						
4-ISOPROPYLTOLUENE						
4-METHYL-2-PENTANONE						
ACETONE						
ACRYLONITRILE						
BENZENE						
BROMOBENZENE						
BROMOCHLOROMETHANE						
BROMODICHLOROMETHANE						
BROMOFORM						
BROMOMETHANE						
CARBON DISULFIDE						
CARBON TETRACHLORIDE						
CHLOROBENZENE						
CHLORODIBROMOMETHANE						
CHLOROETHANE						
CHLOROFORM						
CHLOROMETHANE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB106A	DASS107	DASB107	DASS108	DASB108	
SAMPLE ID	DASB106A-0204	DASS107-0002	DASB107-0204	DASS108-0002	DASB108-0305	DASS109-0002
SAMPLE DATE	20110525	20100421	20100421	20100421	20100421	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SB	SS
TOP DEPTH	2	0	2	0	3	0
BOTTOM DEPTH	4	2	4	2	5	2
CIS-1,2-DICHLOROETHENE						
CIS-1,3-DICHLOROPROPENE						
DIBROMOMETHANE						
DICHLORODIFLUOROMETHANE						
DIETHYL ETHER						
DIISOPROPYL ETHER						
ETHYL METHACRYLATE						
ETHYL TERT-BUTYL ETHER						
ETHYLBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROETHANE						
ISOPROPYLBENZENE						
M+P-XYLENES						
METHYL IODIDE						
METHYL TERT-BUTYL ETHER						
METHYLENE CHLORIDE						
NAPHTHALENE						
N-BUTYLBENZENE						
N-PROPYLBENZENE						
O-XYLENE						
SEC-BUTYLBENZENE						
STYRENE						
TERT-AMYL METHYL ETHER						
TERT-BUTYLBENZENE						
TERTIARY-BUTYL ALCOHOL						
TETRACHLOROETHENE						
TOLUENE						
TOTAL XYLENES						
TRANS-1,2-DICHLOROETHENE						
TRANS-1,3-DICHLOROPROPENE						
TRANS-1,4-DICHLORO-2-BUTENE						
TRICHLOROETHENE						
TRICHLOROFLUOROMETHANE						
VINYL CHLORIDE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS109		DASS109A	DASB109	DASB109A	DASS110
SAMPLE ID	DASS109-0002	DASS109-0002-D	DASS109A-0002	DASB109-0305	DASB109A-0204	DASS110-0002
SAMPLE DATE	20100420	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SB	SB	SS
TOP DEPTH	0	0	0	3	2	0
BOTTOM DEPTH	2	2	2	5	4	2
METALS (MG/KG)						
ARSENIC	9.05	8.9		11		8.1
BARIUM	140	130		110		140
CADMIUM	0.45	0.45		0.65		1.3
CHROMIUM	13	14 J		10 J		11 J
COPPER	69	67		180		220
LEAD	400	350		2400		480
MERCURY			0.031 J		0.55	
SELENIUM	0.58	0.57		2.6		0.57
SILVER	0.12	0.11		0.19		0.23
ZINC	195	190		260		660
MISCELLANEOUS PARAMETERS (%)						
PERCENT MOISTURE						
PERCENT SOLIDS			95		81	
TOTAL SOLIDS	91	90		79		91
PESTICIDES/PCBS (UG/KG)						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT						
ALDRIN						
ALPHA-BHC						
ALPHA-CHLORDANE						
AROCLOR-1016						
AROCLOR-1221						
AROCLOR-1232						
AROCLOR-1242						
AROCLOR-1248						
AROCLOR-1254						
AROCLOR-1260						
BETA-BHC						
CHLORDANE (TECHNICAL)						
DELTA-BHC						
DIELDRIN						
ENDOSULFAN I						
ENDOSULFAN II						
ENDOSULFAN SULFATE						
ENDRIN						
ENDRIN ALDEHYDE						
ENDRIN KETONE						
GAMMA-BHC (LINDANE)						
GAMMA-CHLORDANE						
HEPTACHLOR						
HEPTACHLOR EPOXIDE						
METHOXYCHLOR						
TOXAPHENE						

LOCATION	DASS109		DASS109A	DASB109	DASB109A	DASS110
SAMPLE ID	DASS109-0002	DASS109-0002-D	DASS109A-0002	DASB109-0305	DASB109A-0204	DASS110-0002
SAMPLE DATE	20100420	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SB	SB	SS
TOP DEPTH	0	0	0	3	2	0
BOTTOM DEPTH	2	2	2	5	4	2
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
2-METHYLNAPHTHALENE			1800 U		210 U	
ACENAPHTHENE			1800 U		210 U	
ACENAPHTHYLENE			1800 U		210 U	
ANTHRACENE			1800 U		85 J	
BAP EQUIVALENT-HALFND			1555.58		580.37	
BAP EQUIVALENT-POS			565.58		475.37	
BENZO(A)ANTHRACENE			580 J		390	
BENZO(A)PYRENE			450 J		370	
BENZO(B)FLUORANTHENE			550 J		460	
BENZO(G,H,I)PERYLENE			240 J		190 J	
BENZO(K)FLUORANTHENE			210 J		200 J	
CHRYSENE			480 J		370	
DIBENZO(A,H)ANTHRACENE			1800 U		210 U	
FLUORANTHENE			580 J		620	
FLUORENE			1800 U		210 U	
INDENO(1,2,3-CD)PYRENE			1800 U		180 J	
NAPHTHALENE			1800 U		13 J	
PHENANTHRENE			550 J		370	
PYRENE			1800		710	
SEMIVOLATILES (UG/KG)						
1,2,4-TRICHLOROBENZENE						
1,2-DICHLOROBENZENE						
1,3-DICHLOROBENZENE						
1,4-DICHLOROBENZENE						
2,2'-OXYBIS(1-CHLOROPROPANE)						
2,4,5-TRICHLOROPHENOL						
2,4,6-TRICHLOROPHENOL						
2,4-DICHLOROPHENOL						
2,4-DIMETHYLPHENOL						
2,4-DINITROPHENOL						
2,4-DINITROTOLUENE						
2,6-DINITROTOLUENE						
2-CHLORONAPHTHALENE						
2-CHLOROPHENOL						
2-METHYLNAPHTHALENE						
2-METHYLPHENOL						
2-NITROANILINE						
2-NITROPHENOL						
3&4-METHYLPHENOL						
3,3'-DICHLOROBENZIDINE						
3-NITROANILINE						
4,6-DINITRO-2-METHYLPHENOL						
4-BROMOPHENYL PHENYL ETHER						
4-CHLORO-3-METHYLPHENOL						

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FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS109		DASS109A	DASB109	DASB109A	DASS110
SAMPLE ID	DASS109-0002	DASS109-0002-D	DASS109A-0002	DASB109-0305	DASB109A-0204	DASS110-0002
SAMPLE DATE	20100420	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SB	SB	SS
TOP DEPTH	0	0	0	3	2	0
BOTTOM DEPTH	2	2	2	5	4	2
4-CHLOROANILINE						
4-CHLOROPHENYL PHENYL ETHER						
4-NITROANILINE						
4-NITROPHENOL						
ACENAPHTHENE						
ACENAPHTHYLENE						
ANTHRACENE						
BAP EQUIVALENT-HALFND						
BAP EQUIVALENT-POS						
BENZO(A)ANTHRACENE						
BENZO(A)PYRENE						
BENZO(B)FLUORANTHENE						
BENZO(G,H,I)PERYLENE						
BENZO(K)FLUORANTHENE						
BIS(2-CHLOROETHOXY)METHANE						
BIS(2-CHLOROETHYL)ETHER						
BIS(2-ETHYLHEXYL)PHTHALATE						
BUTYL BENZYL PHTHALATE						
CARBAZOLE						
CHRYSENE						
DIBENZO(A,H)ANTHRACENE						
DIBENZOFURAN						
DIETHYL PHTHALATE						
DIMETHYL PHTHALATE						
DI-N-BUTYL PHTHALATE						
DI-N-OCTYL PHTHALATE						
FLUORANTHENE						
FLUORENE						
HEXACHLOROBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROCYCLOPENTADIENE						
HEXACHLOROETHANE						
INDENO(1,2,3-CD)PYRENE						
ISOPHORONE						
NAPHTHALENE						
NITROBENZENE						
N-NITROSO-DI-N-PROPYLAMINE						
N-NITROSODIPHENYLAMINE						
PENTACHLOROPHENOL						
PHENANTHRENE						
PHENOL						
PYRENE						

LOCATION	DASS109		DASS109A	DASB109	DASB109A	DASS110
SAMPLE ID	DASS109-0002	DASS109-0002-D	DASS109A-0002	DASB109-0305	DASB109A-0204	DASS110-0002
SAMPLE DATE	20100420	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SB	SB	SS
TOP DEPTH	0	0	0	3	2	0
BOTTOM DEPTH	2	2	2	5	4	2
VOLATILES (UG/KG)						
1,1,1,2-TETRACHLOROETHANE						
1,1,1-TRICHLOROETHANE						
1,1,2,2-TETRACHLOROETHANE						
1,1,2-TRICHLOROETHANE						
1,1,2-TRICHLOROTRIFLUOROETHANE						
1,1-DICHLOROETHANE						
1,1-DICHLOROETHENE						
1,1-DICHLOROPROPENE						
1,2,3-TRICHLOROBENZENE						
1,2,3-TRICHLOROPROPANE						
1,2,3-TRIMETHYLBENZENE						
1,2,4-TRICHLOROBENZENE						
1,2,4-TRIMETHYLBENZENE						
1,2-DIBROMO-3-CHLOROPROPANE						
1,2-DIBROMOETHANE						
1,2-DICHLOROBENZENE						
1,2-DICHLOROETHANE						
1,2-DICHLOROPROPANE						
1,3,5-TRIMETHYLBENZENE						
1,3-DICHLOROBENZENE						
1,3-DICHLOROPROPANE						
1,4-DICHLOROBENZENE						
2,2-DICHLOROPROPANE						
2-BUTANONE						
2-CHLOROETHYL VINYL ETHER						
2-CHLOROTOLUENE						
2-HEXANONE						
2-METHYLNAPHTHALENE						
2-NITROPROPANE						
4-CHLOROTOLUENE						
4-ISOPROPYLTOLUENE						
4-METHYL-2-PENTANONE						
ACETONE						
ACRYLONITRILE						
BENZENE						
BROMOBENZENE						
BROMOCHLOROMETHANE						
BROMODICHLOROMETHANE						
BROMOFORM						
BROMOMETHANE						
CARBON DISULFIDE						
CARBON TETRACHLORIDE						
CHLOROBENZENE						
CHLORODIBROMOMETHANE						
CHLOROETHANE						
CHLOROFORM						
CHLOROMETHANE						

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FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS109		DASS109A	DASB109	DASB109A	DASS110
SAMPLE ID	DASS109-0002	DASS109-0002-D	DASS109A-0002	DASB109-0305	DASB109A-0204	DASS110-0002
SAMPLE DATE	20100420	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SS	SS	SB	SB	SS
TOP DEPTH	0	0	0	3	2	0
BOTTOM DEPTH	2	2	2	5	4	2
CIS-1,2-DICHLOROETHENE						
CIS-1,3-DICHLOROPROPENE						
DIBROMOMETHANE						
DICHLORODIFLUOROMETHANE						
DIETHYL ETHER						
DIISOPROPYL ETHER						
ETHYL METHACRYLATE						
ETHYL TERT-BUTYL ETHER						
ETHYLBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROETHANE						
ISOPROPYLBENZENE						
M+P-XYLENES						
METHYL IODIDE						
METHYL TERT-BUTYL ETHER						
METHYLENE CHLORIDE						
NAPHTHALENE						
N-BUTYLBENZENE						
N-PROPYLBENZENE						
O-XYLENE						
SEC-BUTYLBENZENE						
STYRENE						
TERT-AMYL METHYL ETHER						
TERT-BUTYLBENZENE						
TERTIARY-BUTYL ALCOHOL						
TETRACHLOROETHENE						
TOLUENE						
TOTAL XYLENES						
TRANS-1,2-DICHLOROETHENE						
TRANS-1,3-DICHLOROPROPENE						
TRANS-1,4-DICHLORO-2-BUTENE						
TRICHLOROETHENE						
TRICHLOROFLUOROMETHANE						
VINYL CHLORIDE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS110A	DASB110	DASB110A	DASS111		
SAMPLE ID	DASS110A-0002	DASB110-0305	DASB110A-0305	DASS111-0002	DASS111-0002	DASS111-0002-D
SAMPLE DATE	20110525	20100420	20110525	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SS
TOP DEPTH	0	3	3	0	0	0
BOTTOM DEPTH	2	5	5	2	2	2
METALS (MG/KG)						
ARSENIC		6.9		7.6	7.9	8.2
BARIUM		59		110	125	140
CADMIUM		2.5		0.86	0.825	0.79
CHROMIUM		14 J		13 J	12.5	12 J
COPPER		79		190	205	220
LEAD		160		370	340	310
MERCURY	0.37		0.11			
SELENIUM		0.54		0.5	0.525	0.55
SILVER		0.22		0.2	0.185	0.17
ZINC		210		450 J	360	270 J
MISCELLANEOUS PARAMETERS (%)						
PERCENT MOISTURE						
PERCENT SOLIDS	88		84			
TOTAL SOLIDS		87		91	91	91
PESTICIDES/PCBS (UG/KG)						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT						
ALDRIN						
ALPHA-BHC						
ALPHA-CHLORDANE						
AROCLOR-1016						
AROCLOR-1221						
AROCLOR-1232						
AROCLOR-1242						
AROCLOR-1248						
AROCLOR-1254						
AROCLOR-1260						
BETA-BHC						
CHLORDANE (TECHNICAL)						
DELTA-BHC						
DIELDRIN						
ENDOSULFAN I						
ENDOSULFAN II						
ENDOSULFAN SULFATE						
ENDRIN						
ENDRIN ALDEHYDE						
ENDRIN KETONE						
GAMMA-BHC (LINDANE)						
GAMMA-CHLORDANE						
HEPTACHLOR						
HEPTACHLOR EPOXIDE						
METHOXYCHLOR						
TOXAPHENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS110A	DASB110	DASB110A	DASS111		
SAMPLE ID	DASS110A-0002	DASB110-0305	DASB110A-0305	DASS111-0002	DASS111-0002	DASS111-0002-D
SAMPLE DATE	20110525	20100420	20110525	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SS
TOP DEPTH	0	3	3	0	0	0
BOTTOM DEPTH	2	5	5	2	2	2
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
2-METHYLNAPHTHALENE	19 J		2.8 J			
ACENAPHTHENE	190 U		5.6 J			
ACENAPHTHYLENE	190 U		20 U			
ANTHRACENE	75 J		8.4 J			
BAP EQUIVALENT-HALFND	664.65		39.701			
BAP EQUIVALENT-POS	569.65		29.701			
BENZO(A)ANTHRACENE	470		35			
BENZO(A)PYRENE	440		22			
BENZO(B)FLUORANTHENE	600		31			
BENZO(G,H,I)PERYLENE	220		12 J			
BENZO(K)FLUORANTHENE	220		7.2 J			
CHRYSENE	450		29			
DIBENZO(A,H)ANTHRACENE	190 U		20 U			
FLUORANTHENE	800		33			
FLUORENE	190 U		5.6 J			
INDENO(1,2,3-CD)PYRENE	200		10 J			
NAPHTHALENE	23 J		2 J			
PHENANTHRENE	330		23			
PYRENE	800		59			
SEMIVOLATILES (UG/KG)						
1,2,4-TRICHLOROBENZENE						
1,2-DICHLOROBENZENE						
1,3-DICHLOROBENZENE						
1,4-DICHLOROBENZENE						
2,2'-OXYBIS(1-CHLOROPROPANE)						
2,4,5-TRICHLOROPHENOL						
2,4,6-TRICHLOROPHENOL						
2,4-DICHLOROPHENOL						
2,4-DIMETHYLPHENOL						
2,4-DINITROPHENOL						
2,4-DINITROTOLUENE						
2,6-DINITROTOLUENE						
2-CHLORONAPHTHALENE						
2-CHLOROPHENOL						
2-METHYLNAPHTHALENE						
2-METHYLPHENOL						
2-NITROANILINE						
2-NITROPHENOL						
3&4-METHYLPHENOL						
3,3'-DICHLOROBENZIDINE						
3-NITROANILINE						
4,6-DINITRO-2-METHYLPHENOL						
4-BROMOPHENYL PHENYL ETHER						
4-CHLORO-3-METHYLPHENOL						

LOCATION	DASS110A	DASB110	DASB110A	DASS111		
SAMPLE ID	DASS110A-0002	DASB110-0305	DASB110A-0305	DASS111-0002	DASS111-0002	DASS111-0002-D
SAMPLE DATE	20110525	20100420	20110525	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SS
TOP DEPTH	0	3	3	0	0	0
BOTTOM DEPTH	2	5	5	2	2	2
4-CHLOROANILINE						
4-CHLOROPHENYL PHENYL ETHER						
4-NITROANILINE						
4-NITROPHENOL						
ACENAPHTHENE						
ACENAPHTHYLENE						
ANTHRACENE						
BAP EQUIVALENT-HALFND						
BAP EQUIVALENT-POS						
BENZO(A)ANTHRACENE						
BENZO(A)PYRENE						
BENZO(B)FLUORANTHENE						
BENZO(G,H,I)PERYLENE						
BENZO(K)FLUORANTHENE						
BIS(2-CHLOROETHOXY)METHANE						
BIS(2-CHLOROETHYL)ETHER						
BIS(2-ETHYLHEXYL)PHTHALATE						
BUTYL BENZYL PHTHALATE						
CARBAZOLE						
CHRYSENE						
DIBENZO(A,H)ANTHRACENE						
DIBENZOFURAN						
DIETHYL PHTHALATE						
DIMETHYL PHTHALATE						
DI-N-BUTYL PHTHALATE						
DI-N-OCTYL PHTHALATE						
FLUORANTHENE						
FLUORENE						
HEXACHLOROBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROCYCLOPENTADIENE						
HEXACHLOROETHANE						
INDENO(1,2,3-CD)PYRENE						
ISOPHORONE						
NAPHTHALENE						
NITROBENZENE						
N-NITROSO-DI-N-PROPYLAMINE						
N-NITROSODIPHENYLAMINE						
PENTACHLOROPHENOL						
PHENANTHRENE						
PHENOL						
PYRENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS110A	DASB110	DASB110A		DASS111	
SAMPLE ID	DASS110A-0002	DASB110-0305	DASB110A-0305	DASS111-0002	DASS111-0002	DASS111-0002-D
SAMPLE DATE	20110525	20100420	20110525	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SS
TOP DEPTH	0	3	3	0	0	0
BOTTOM DEPTH	2	5	5	2	2	2
VOLATILES (UG/KG)						
1,1,1,2-TETRACHLOROETHANE						
1,1,1-TRICHLOROETHANE						
1,1,2,2-TETRACHLOROETHANE						
1,1,2-TRICHLOROETHANE						
1,1,2-TRICHLOROTRIFLUOROETHANE						
1,1-DICHLOROETHANE						
1,1-DICHLOROETHENE						
1,1-DICHLOROPROPENE						
1,2,3-TRICHLOROBENZENE						
1,2,3-TRICHLOROPROPANE						
1,2,3-TRIMETHYLBENZENE						
1,2,4-TRICHLOROBENZENE						
1,2,4-TRIMETHYLBENZENE						
1,2-DIBROMO-3-CHLOROPROPANE						
1,2-DIBROMOETHANE						
1,2-DICHLOROBENZENE						
1,2-DICHLOROETHANE						
1,2-DICHLOROPROPANE						
1,3,5-TRIMETHYLBENZENE						
1,3-DICHLOROBENZENE						
1,3-DICHLOROPROPANE						
1,4-DICHLOROBENZENE						
2,2-DICHLOROPROPANE						
2-BUTANONE						
2-CHLOROETHYL VINYL ETHER						
2-CHLOROTOLUENE						
2-HEXANONE						
2-METHYLNAPHTHALENE						
2-NITROPROPANE						
4-CHLOROTOLUENE						
4-ISOPROPYLTOLUENE						
4-METHYL-2-PENTANONE						
ACETONE						
ACRYLONITRILE						
BENZENE						
BROMOBENZENE						
BROMOCHLOROMETHANE						
BROMODICHLOROMETHANE						
BROMOFORM						
BROMOMETHANE						
CARBON DISULFIDE						
CARBON TETRACHLORIDE						
CHLOROBENZENE						
CHLORODIBROMOMETHANE						
CHLOROETHANE						
CHLOROFORM						
CHLOROMETHANE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS110A	DASB110	DASB110A		DASS111	
SAMPLE ID	DASS110A-0002	DASB110-0305	DASB110A-0305	DASS111-0002	DASS111-0002	DASS111-0002-D
SAMPLE DATE	20110525	20100420	20110525	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SS
TOP DEPTH	0	3	3	0	0	0
BOTTOM DEPTH	2	5	5	2	2	2
CIS-1,2-DICHLOROETHENE						
CIS-1,3-DICHLOROPROPENE						
DIBROMOMETHANE						
DICHLORODIFLUOROMETHANE						
DIETHYL ETHER						
DIISOPROPYL ETHER						
ETHYL METHACRYLATE						
ETHYL TERT-BUTYL ETHER						
ETHYLBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROETHANE						
ISOPROPYLBENZENE						
M+P-XYLENES						
METHYL IODIDE						
METHYL TERT-BUTYL ETHER						
METHYLENE CHLORIDE						
NAPHTHALENE						
N-BUTYLBENZENE						
N-PROPYLBENZENE						
O-XYLENE						
SEC-BUTYLBENZENE						
STYRENE						
TERT-AMYL METHYL ETHER						
TERT-BUTYLBENZENE						
TERTIARY-BUTYL ALCOHOL						
TETRACHLOROETHENE						
TOLUENE						
TOTAL XYLENES						
TRANS-1,2-DICHLOROETHENE						
TRANS-1,3-DICHLOROPROPENE						
TRANS-1,4-DICHLORO-2-BUTENE						
TRICHLOROETHENE						
TRICHLOROFLUOROMETHANE						
VINYL CHLORIDE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS111A	DASB111	DASB111A	DASS112	DASS112A	DASB112
SAMPLE ID	DASS111A-0002	DASB111-0305	DASB111A-0305	DASS112-0002	DASS112A-0002	DASB112-0305
SAMPLE DATE	20110525	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SB
TOP DEPTH	0	3	3	0	0	3
BOTTOM DEPTH	2	5	5	2	2	5
METALS (MG/KG)						
ARSENIC		4.7		19		7.6
BARIUM		61		420		75
CADMIUM		0.14		2.6		0.22
CHROMIUM		17 J		15 J		19 J
COPPER		14		620		30
LEAD		11		970		94
MERCURY	0.64		0.05		0.54	
SELENIUM		0.14		0.6		0.42
SILVER		0.085		0.28		0.096
ZINC		41		670		77
MISCELLANEOUS PARAMETERS (%)						
PERCENT MOISTURE						
PERCENT SOLIDS	88		87		90	
TOTAL SOLIDS		89		89		84
PESTICIDES/PCBS (UG/KG)						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT						
ALDRIN						
ALPHA-BHC						
ALPHA-CHLORDANE						
AROCLOR-1016						
AROCLOR-1221						
AROCLOR-1232						
AROCLOR-1242						
AROCLOR-1248						
AROCLOR-1254						
AROCLOR-1260						
BETA-BHC						
CHLORDANE (TECHNICAL)						
DELTA-BHC						
DIELDRIN						
ENDOSULFAN I						
ENDOSULFAN II						
ENDOSULFAN SULFATE						
ENDRIN						
ENDRIN ALDEHYDE						
ENDRIN KETONE						
GAMMA-BHC (LINDANE)						
GAMMA-CHLORDANE						
HEPTACHLOR						
HEPTACHLOR EPOXIDE						
METHOXYCHLOR						
TOXAPHENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS111A	DASB111	DASB111A	DASS112	DASS112A	DASB112
SAMPLE ID	DASS111A-0002	DASB111-0305	DASB111A-0305	DASS112-0002	DASS112A-0002	DASB112-0305
SAMPLE DATE	20110525	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SB
TOP DEPTH	0	3	3	0	0	3
BOTTOM DEPTH	2	5	5	2	2	5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
2-METHYLNAPHTHALENE	56 J		25 J		17 J	
ACENAPHTHENE	240		38 U		10 J	
ACENAPHTHYLENE	89 J		38 U		37 U	
ANTHRACENE	690		5.5 J		29 J	
BAP EQUIVALENT-HALFND	3305.3		29.915		165.69	
BAP EQUIVALENT-POS	3305.3		10.915		147.19	
BENZO(A)ANTHRACENE	2600		14 J		140	
BENZO(A)PYRENE	2300		7.8 J		110	
BENZO(B)FLUORANTHENE	2900		10 J		160	
BENZO(G,H,I)PERYLENE	1100		7.8 J		70	
BENZO(K)FLUORANTHENE	1300		7 J		67	
CHRYSENE	2300		15 J		120	
DIBENZO(A,H)ANTHRACENE	320		38 U		37 U	
FLUORANTHENE	4600		13 J		160	
FLUORENE	230		38 U		14 J	
INDENO(1,2,3-CD)PYRENE	1200		6.3 J		64	
NAPHTHALENE	63 J		10 J		15 J	
PHENANTHRENE	3400		32 J		130	
PYRENE	5100		15 J		250	
SEMIVOLATILES (UG/KG)						
1,2,4-TRICHLOROBENZENE						
1,2-DICHLOROBENZENE						
1,3-DICHLOROBENZENE						
1,4-DICHLOROBENZENE						
2,2'-OXYBIS(1-CHLOROPROPANE)						
2,4,5-TRICHLOROPHENOL						
2,4,6-TRICHLOROPHENOL						
2,4-DICHLOROPHENOL						
2,4-DIMETHYLPHENOL						
2,4-DINITROPHENOL						
2,4-DINITROTOLUENE						
2,6-DINITROTOLUENE						
2-CHLORONAPHTHALENE						
2-CHLOROPHENOL						
2-METHYLNAPHTHALENE						
2-METHYLPHENOL						
2-NITROANILINE						
2-NITROPHENOL						
3&4-METHYLPHENOL						
3,3'-DICHLOROBENZIDINE						
3-NITROANILINE						
4,6-DINITRO-2-METHYLPHENOL						
4-BROMOPHENYL PHENYL ETHER						
4-CHLORO-3-METHYLPHENOL						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS111A	DASB111	DASB111A	DASS112	DASS112A	DASB112
SAMPLE ID	DASS111A-0002	DASB111-0305	DASB111A-0305	DASS112-0002	DASS112A-0002	DASB112-0305
SAMPLE DATE	20110525	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SB
TOP DEPTH	0	3	3	0	0	3
BOTTOM DEPTH	2	5	5	2	2	5
4-CHLOROANILINE						
4-CHLOROPHENYL PHENYL ETHER						
4-NITROANILINE						
4-NITROPHENOL						
ACENAPHTHENE						
ACENAPHTHYLENE						
ANTHRACENE						
BAP EQUIVALENT-HALFND						
BAP EQUIVALENT-POS						
BENZO(A)ANTHRACENE						
BENZO(A)PYRENE						
BENZO(B)FLUORANTHENE						
BENZO(G,H,I)PERYLENE						
BENZO(K)FLUORANTHENE						
BIS(2-CHLOROETHOXY)METHANE						
BIS(2-CHLOROETHYL)ETHER						
BIS(2-ETHYLHEXYL)PHTHALATE						
BUTYL BENZYL PHTHALATE						
CARBAZOLE						
CHRYSENE						
DIBENZO(A,H)ANTHRACENE						
DIBENZOFURAN						
DIETHYL PHTHALATE						
DIMETHYL PHTHALATE						
DI-N-BUTYL PHTHALATE						
DI-N-OCTYL PHTHALATE						
FLUORANTHENE						
FLUORENE						
HEXACHLOROBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROCYCLOPENTADIENE						
HEXACHLOROETHANE						
INDENO(1,2,3-CD)PYRENE						
ISOPHORONE						
NAPHTHALENE						
NITROBENZENE						
N-NITROSO-DI-N-PROPYLAMINE						
N-NITROSODIPHENYLAMINE						
PENTACHLOROPHENOL						
PHENANTHRENE						
PHENOL						
PYRENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS111A	DASB111	DASB111A	DASS112	DASS112A	DASB112
SAMPLE ID	DASS111A-0002	DASB111-0305	DASB111A-0305	DASS112-0002	DASS112A-0002	DASB112-0305
SAMPLE DATE	20110525	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SB
TOP DEPTH	0	3	3	0	0	3
BOTTOM DEPTH	2	5	5	2	2	5
VOLATILES (UG/KG)						
1,1,1,2-TETRACHLOROETHANE						
1,1,1-TRICHLOROETHANE						
1,1,2,2-TETRACHLOROETHANE						
1,1,2-TRICHLOROETHANE						
1,1,2-TRICHLOROTRIFLUOROETHANE						
1,1-DICHLOROETHANE						
1,1-DICHLOROETHENE						
1,1-DICHLOROPROPENE						
1,2,3-TRICHLOROBENZENE						
1,2,3-TRICHLOROPROPANE						
1,2,3-TRIMETHYLBENZENE						
1,2,4-TRICHLOROBENZENE						
1,2,4-TRIMETHYLBENZENE						
1,2-DIBROMO-3-CHLOROPROPANE						
1,2-DIBROMOETHANE						
1,2-DICHLOROBENZENE						
1,2-DICHLOROETHANE						
1,2-DICHLOROPROPANE						
1,3,5-TRIMETHYLBENZENE						
1,3-DICHLOROBENZENE						
1,3-DICHLOROPROPANE						
1,4-DICHLOROBENZENE						
2,2-DICHLOROPROPANE						
2-BUTANONE						
2-CHLOROETHYL VINYL ETHER						
2-CHLOROTOLUENE						
2-HEXANONE						
2-METHYLNAPHTHALENE						
2-NITROPROPANE						
4-CHLOROTOLUENE						
4-ISOPROPYLTOLUENE						
4-METHYL-2-PENTANONE						
ACETONE						
ACRYLONITRILE						
BENZENE						
BROMOBENZENE						
BROMOCHLOROMETHANE						
BROMODICHLOROMETHANE						
BROMOFORM						
BROMOMETHANE						
CARBON DISULFIDE						
CARBON TETRACHLORIDE						
CHLOROBENZENE						
CHLORODIBROMOMETHANE						
CHLOROETHANE						
CHLOROFORM						
CHLOROMETHANE						

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FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS111A	DASB111	DASB111A	DASS112	DASS112A	DASB112
SAMPLE ID	DASS111A-0002	DASB111-0305	DASB111A-0305	DASS112-0002	DASS112A-0002	DASB112-0305
SAMPLE DATE	20110525	20100420	20110525	20100420	20110525	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SS	SS	SB
TOP DEPTH	0	3	3	0	0	3
BOTTOM DEPTH	2	5	5	2	2	5
CIS-1,2-DICHLOROETHENE						
CIS-1,3-DICHLOROPROPENE						
DIBROMOMETHANE						
DICHLORODIFLUOROMETHANE						
DIETHYL ETHER						
DIISOPROPYL ETHER						
ETHYL METHACRYLATE						
ETHYL TERT-BUTYL ETHER						
ETHYLBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROETHANE						
ISOPROPYLBENZENE						
M+P-XYLENES						
METHYL IODIDE						
METHYL TERT-BUTYL ETHER						
METHYLENE CHLORIDE						
NAPHTHALENE						
N-BUTYLBENZENE						
N-PROPYLBENZENE						
O-XYLENE						
SEC-BUTYLBENZENE						
STYRENE						
TERT-AMYL METHYL ETHER						
TERT-BUTYLBENZENE						
TERTIARY-BUTYL ALCOHOL						
TETRACHLOROETHENE						
TOLUENE						
TOTAL XYLENES						
TRANS-1,2-DICHLOROETHENE						
TRANS-1,3-DICHLOROPROPENE						
TRANS-1,4-DICHLORO-2-BUTENE						
TRICHLOROETHENE						
TRICHLOROFLUOROMETHANE						
VINYL CHLORIDE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB112A	DASS114	DASB114		DASS115	
SAMPLE ID	DASB112A-0204	DASS114-0002	DASB114-0305	DASS115-0002	DASS115-0002	DASS115-0002-D
SAMPLE DATE	20110525	20100421	20100421	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SS
TOP DEPTH	2	0	3	0	0	0
BOTTOM DEPTH	4	2	5	2	2	2
METALS (MG/KG)						
ARSENIC		7.3	17	8.4	8.6	8.8
BARIUM		140	150	100	105	110
CADMIUM		0.71	0.47	0.42	0.47	0.52
CHROMIUM		20 J	16	14 J	15	16 J
COPPER		77	65	85	97.5	110
LEAD		410	760	280	290	300
MERCURY	0.49	0.41 J	0.69			
SELENIUM		0.5	1.9	0.74	0.74	0.74
SILVER		0.12	0.18	0.095	0.0975	0.1
ZINC		210	230	140	160	180
MISCELLANEOUS PARAMETERS (%)						
PERCENT MOISTURE						
PERCENT SOLIDS	83					
TOTAL SOLIDS		93	83	92	91.5	91
PESTICIDES/PCBS (UG/KG)						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT						
ALDRIN						
ALPHA-BHC						
ALPHA-CHLORDANE						
AROCLOR-1016						
AROCLOR-1221						
AROCLOR-1232						
AROCLOR-1242						
AROCLOR-1248						
AROCLOR-1254						
AROCLOR-1260						
BETA-BHC						
CHLORDANE (TECHNICAL)						
DELTA-BHC						
DIELDRIN						
ENDOSULFAN I						
ENDOSULFAN II						
ENDOSULFAN SULFATE						
ENDRIN						
ENDRIN ALDEHYDE						
ENDRIN KETONE						
GAMMA-BHC (LINDANE)						
GAMMA-CHLORDANE						
HEPTACHLOR						
HEPTACHLOR EPOXIDE						
METHOXYCHLOR						
TOXAPHENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB112A	DASS114	DASB114		DASS115	
SAMPLE ID	DASB112A-0204	DASS114-0002	DASB114-0305	DASS115-0002	DASS115-0002	DASS115-0002-D
SAMPLE DATE	20110525	20100421	20100421	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SS
TOP DEPTH	2	0	3	0	0	0
BOTTOM DEPTH	4	2	5	2	2	2
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
2-METHYLNAPHTHALENE	9.5 J	360 U	69 J			
ACENAPHTHENE	40 U	360 U	18 J			
ACENAPHTHYLENE	40 U	360 U	11 J			
ANTHRACENE	13 J	92 J	77 J			
BAP EQUIVALENT-HALFND	125.785	925.22	408.12			
BAP EQUIVALENT-POS	105.785	745.22	358.12			
BENZO(A)ANTHRACENE	86	600	250			
BENZO(A)PYRENE	81	560	280			
BENZO(B)FLUORANTHENE	110	800	340			
BENZO(G,H,I)PERYLENE	52	510	200			
BENZO(K)FLUORANTHENE	31 J	730	84 J			
CHRYSENE	75	920	280			
DIBENZO(A,H)ANTHRACENE	40 U	360 U	100 U			
FLUORANTHENE	110	860	420			
FLUORENE	40 U	360 U	22 J			
INDENO(1,2,3-CD)PYRENE	48	370	180			
NAPHTHALENE	5.5 J	34 J	45 J			
PHENANTHRENE	69	360	270			
PYRENE	140	800	450			
SEMIVOLATILES (UG/KG)						
1,2,4-TRICHLOROBENZENE						
1,2-DICHLOROBENZENE						
1,3-DICHLOROBENZENE						
1,4-DICHLOROBENZENE						
2,2'-OXYBIS(1-CHLOROPROPANE)						
2,4,5-TRICHLOROPHENOL						
2,4,6-TRICHLOROPHENOL						
2,4-DICHLOROPHENOL						
2,4-DIMETHYLPHENOL						
2,4-DINITROPHENOL						
2,4-DINITROTOLUENE						
2,6-DINITROTOLUENE						
2-CHLORONAPHTHALENE						
2-CHLOROPHENOL						
2-METHYLNAPHTHALENE						
2-METHYLPHENOL						
2-NITROANILINE						
2-NITROPHENOL						
3&4-METHYLPHENOL						
3,3'-DICHLOROBENZIDINE						
3-NITROANILINE						
4,6-DINITRO-2-METHYLPHENOL						
4-BROMOPHENYL PHENYL ETHER						
4-CHLORO-3-METHYLPHENOL						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB112A	DASS114	DASB114		DASS115	
SAMPLE ID	DASB112A-0204	DASS114-0002	DASB114-0305	DASS115-0002	DASS115-0002	DASS115-0002-D
SAMPLE DATE	20110525	20100421	20100421	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SS
TOP DEPTH	2	0	3	0	0	0
BOTTOM DEPTH	4	2	5	2	2	2
4-CHLOROANILINE						
4-CHLOROPHENYL PHENYL ETHER						
4-NITROANILINE						
4-NITROPHENOL						
ACENAPHTHENE						
ACENAPHTHYLENE						
ANTHRACENE						
BAP EQUIVALENT-HALFND						
BAP EQUIVALENT-POS						
BENZO(A)ANTHRACENE						
BENZO(A)PYRENE						
BENZO(B)FLUORANTHENE						
BENZO(G,H,I)PERYLENE						
BENZO(K)FLUORANTHENE						
BIS(2-CHLOROETHOXY)METHANE						
BIS(2-CHLOROETHYL)ETHER						
BIS(2-ETHYLHEXYL)PHTHALATE						
BUTYL BENZYL PHTHALATE						
CARBAZOLE						
CHRYSENE						
DIBENZO(A,H)ANTHRACENE						
DIBENZOFURAN						
DIETHYL PHTHALATE						
DIMETHYL PHTHALATE						
DI-N-BUTYL PHTHALATE						
DI-N-OCTYL PHTHALATE						
FLUORANTHENE						
FLUORENE						
HEXACHLOROBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROCYCLOPENTADIENE						
HEXACHLOROETHANE						
INDENO(1,2,3-CD)PYRENE						
ISOPHORONE						
NAPHTHALENE						
NITROBENZENE						
N-NITROSO-DI-N-PROPYLAMINE						
N-NITROSODIPHENYLAMINE						
PENTACHLOROPHENOL						
PHENANTHRENE						
PHENOL						
PYRENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB112A	DASS114	DASB114		DASS115	
SAMPLE ID	DASB112A-0204	DASS114-0002	DASB114-0305	DASS115-0002	DASS115-0002	DASS115-0002-D
SAMPLE DATE	20110525	20100421	20100421	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SS
TOP DEPTH	2	0	3	0	0	0
BOTTOM DEPTH	4	2	5	2	2	2
VOLATILES (UG/KG)						
1,1,1,2-TETRACHLOROETHANE						
1,1,1-TRICHLOROETHANE						
1,1,2,2-TETRACHLOROETHANE						
1,1,2-TRICHLOROETHANE						
1,1,2-TRICHLOROTRIFLUOROETHANE						
1,1-DICHLOROETHANE						
1,1-DICHLOROETHENE						
1,1-DICHLOROPROPENE						
1,2,3-TRICHLOROBENZENE						
1,2,3-TRICHLOROPROPANE						
1,2,3-TRIMETHYLBENZENE						
1,2,4-TRICHLOROBENZENE						
1,2,4-TRIMETHYLBENZENE						
1,2-DIBROMO-3-CHLOROPROPANE						
1,2-DIBROMOETHANE						
1,2-DICHLOROBENZENE						
1,2-DICHLOROETHANE						
1,2-DICHLOROPROPANE						
1,3,5-TRIMETHYLBENZENE						
1,3-DICHLOROBENZENE						
1,3-DICHLOROPROPANE						
1,4-DICHLOROBENZENE						
2,2-DICHLOROPROPANE						
2-BUTANONE						
2-CHLOROETHYL VINYL ETHER						
2-CHLOROTOLUENE						
2-HEXANONE						
2-METHYLNAPHTHALENE						
2-NITROPROPANE						
4-CHLOROTOLUENE						
4-ISOPROPYLTOLUENE						
4-METHYL-2-PENTANONE						
ACETONE						
ACRYLONITRILE						
BENZENE						
BROMOBENZENE						
BROMOCHLOROMETHANE						
BROMODICHLOROMETHANE						
BROMOFORM						
BROMOMETHANE						
CARBON DISULFIDE						
CARBON TETRACHLORIDE						
CHLOROBENZENE						
CHLORODIBROMOMETHANE						
CHLOROETHANE						
CHLOROFORM						
CHLOROMETHANE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB112A	DASS114	DASB114		DASS115	
SAMPLE ID	DASB112A-0204	DASS114-0002	DASB114-0305	DASS115-0002	DASS115-0002	DASS115-0002-D
SAMPLE DATE	20110525	20100421	20100421	20100420	20100420	20100420
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SS	SB	SS	SS	SS
TOP DEPTH	2	0	3	0	0	0
BOTTOM DEPTH	4	2	5	2	2	2
CIS-1,2-DICHLOROETHENE						
CIS-1,3-DICHLOROPROPENE						
DIBROMOMETHANE						
DICHLORODIFLUOROMETHANE						
DIETHYL ETHER						
DIISOPROPYL ETHER						
ETHYL METHACRYLATE						
ETHYL TERT-BUTYL ETHER						
ETHYLBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROETHANE						
ISOPROPYLBENZENE						
M+P-XYLENES						
METHYL IODIDE						
METHYL TERT-BUTYL ETHER						
METHYLENE CHLORIDE						
NAPHTHALENE						
N-BUTYLBENZENE						
N-PROPYLBENZENE						
O-XYLENE						
SEC-BUTYLBENZENE						
STYRENE						
TERT-AMYL METHYL ETHER						
TERT-BUTYLBENZENE						
TERTIARY-BUTYL ALCOHOL						
TETRACHLOROETHENE						
TOLUENE						
TOTAL XYLENES						
TRANS-1,2-DICHLOROETHENE						
TRANS-1,3-DICHLOROPROPENE						
TRANS-1,4-DICHLORO-2-BUTENE						
TRICHLOROETHENE						
TRICHLOROFLUOROMETHANE						
VINYL CHLORIDE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS115A	DASB115	DASB115A	DASB01		
SAMPLE ID	DASS115A-0002	DASB115-0305	DASB115A-0204	DASB010607	DASB010607-AVG	DASB010607-D
SAMPLE DATE	20110525	20100420	20110525	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SB	SB	SB
TOP DEPTH	0	3	2	4	4	4
BOTTOM DEPTH	2	5	4	5	5	5
METALS (MG/KG)						
ARSENIC		5.5				
BARIUM		95				
CADMIUM		0.25				
CHROMIUM		16 J				
COPPER		26				
LEAD		140		9.1	9.1	
MERCURY	0.54		1.3			
SELENIUM		0.45				
SILVER		0.13				
ZINC		110				
MISCELLANEOUS PARAMETERS (%)						
PERCENT MOISTURE						
PERCENT SOLIDS	89		83	83.1	82.7	82.3
TOTAL SOLIDS		87				
PESTICIDES/PCBS (UG/KG)						
4,4'-DDD						
4,4'-DDE						
4,4'-DDT						
ALDRIN						
ALPHA-BHC						
ALPHA-CHLORDANE						
AROCLOR-1016						
AROCLOR-1221						
AROCLOR-1232						
AROCLOR-1242						
AROCLOR-1248						
AROCLOR-1254						
AROCLOR-1260						
BETA-BHC						
CHLORDANE (TECHNICAL)						
DELTA-BHC						
DIELDRIN						
ENDOSULFAN I						
ENDOSULFAN II						
ENDOSULFAN SULFATE						
ENDRIN						
ENDRIN ALDEHYDE						
ENDRIN KETONE						
GAMMA-BHC (LINDANE)						
GAMMA-CHLORDANE						
HEPTACHLOR						
HEPTACHLOR EPOXIDE						
METHOXYCHLOR						
TOXAPHENE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS115A	DASB115	DASB115A		DASB01	
SAMPLE ID	DASS115A-0002	DASB115-0305	DASB115A-0204	DASB010607	DASB010607-AVG	DASB010607-D
SAMPLE DATE	20110525	20100420	20110525	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SB	SB	SB
TOP DEPTH	0	3	2	4	4	4
BOTTOM DEPTH	2	5	4	5	5	5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
2-METHYLNAPHTHALENE	1900 U		41 J			
ACENAPHTHENE	1900 U		120 J			
ACENAPHTHYLENE	1900 U		200 U			
ANTHRACENE	1900 U		310			
BAP EQUIVALENT-HALFND	1609.66		976.48			
BAP EQUIVALENT-POS	564.66		876.48			
BENZO(A)ANTHRACENE	500 J		760			
BENZO(A)PYRENE	460 J		670			
BENZO(B)FLUORANTHENE	500 J		950			
BENZO(G,H,I)PERYLENE	530 J		330			
BENZO(K)FLUORANTHENE	420 J		280			
CHRYSENE	460 J		680			
DIBENZO(A,H)ANTHRACENE	1900 U		200 U			
FLUORANTHENE	610 J		1400			
FLUORENE	1900 U		95 J			
INDENO(1,2,3-CD)PYRENE	1900 U		320			
NAPHTHALENE	1900 U		33 J			
PHENANTHRENE	690 J		1100			
PYRENE	1800 J		1500			
SEMIVOLATILES (UG/KG)						
1,2,4-TRICHLOROBENZENE						
1,2-DICHLOROBENZENE						
1,3-DICHLOROBENZENE						
1,4-DICHLOROBENZENE						
2,2'-OXYBIS(1-CHLOROPROPANE)						
2,4,5-TRICHLOROPHENOL						
2,4,6-TRICHLOROPHENOL						
2,4-DICHLOROPHENOL						
2,4-DIMETHYLPHENOL						
2,4-DINITROPHENOL						
2,4-DINITROTOLUENE						
2,6-DINITROTOLUENE						
2-CHLORONAPHTHALENE						
2-CHLOROPHENOL						
2-METHYLNAPHTHALENE				200 U	200 U	200 U
2-METHYLPHENOL						
2-NITROANILINE						
2-NITROPHENOL						
3&4-METHYLPHENOL						
3,3'-DICHLOROBENZIDINE						
3-NITROANILINE						
4,6-DINITRO-2-METHYLPHENOL						
4-BROMOPHENYL PHENYL ETHER						
4-CHLORO-3-METHYLPHENOL						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS115A	DASB115	DASB115A		DASB01	
SAMPLE ID	DASS115A-0002	DASB115-0305	DASB115A-0204	DASB010607	DASB010607-AVG	DASB010607-D
SAMPLE DATE	20110525	20100420	20110525	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SB	SB	SB
TOP DEPTH	0	3	2	4	4	4
BOTTOM DEPTH	2	5	4	5	5	5
4-CHLOROANILINE						
4-CHLOROPHENYL PHENYL ETHER						
4-NITROANILINE						
4-NITROPHENOL						
ACENAPHTHENE				200 U	200 U	200 U
ACENAPHTHYLENE				200 U	200 U	200 U
ANTHRACENE				200 U	200 U	200 U
BAP EQUIVALENT-HALFND				200 U	172.4163	172.4163
BAP EQUIVALENT-POS				200 U	61.4163	61.4163
BENZO(A)ANTHRACENE				200 U	45.1 J	45.1 J
BENZO(A)PYRENE				200 U	50.5 J	50.5 J
BENZO(B)FLUORANTHENE				200 U	63.6 J	63.6 J
BENZO(G,H,I)PERYLENE				200 U	200 U	200 U
BENZO(K)FLUORANTHENE				200 U	200 U	200 U
BIS(2-CHLOROETHOXY)METHANE						
BIS(2-CHLOROETHYL)ETHER						
BIS(2-ETHYLHEXYL)PHTHALATE						
BUTYL BENZYL PHTHALATE						
CARBAZOLE						
CHRYSENE				200 U	46.3 J	46.3 J
DIBENZO(A,H)ANTHRACENE				200 U	200 U	200 U
DIBENZOFURAN						
DIETHYL PHTHALATE						
DIMETHYL PHTHALATE						
DI-N-BUTYL PHTHALATE						
DI-N-OCTYL PHTHALATE						
FLUORANTHENE				200 U	69.8 J	69.8 J
FLUORENE				200 U	200 U	200 U
HEXACHLOROBENZENE						
HEXACHLOROBUTADIENE						
HEXACHLOROCYCLOPENTADIENE						
HEXACHLOROETHANE						
INDENO(1,2,3-CD)PYRENE				200 U	200 U	200 U
ISOPHORONE						
NAPHTHALENE				200 U	200 U	200 U
NITROBENZENE						
N-NITROSO-DI-N-PROPYLAMINE						
N-NITROSODIPHENYLAMINE						
PENTACHLOROPHENOL						
PHENANTHRENE				200 U	200 U	200 U
PHENOL						
PYRENE				200 U	200 U	200 U

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FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS115A	DASB115	DASB115A		DASB01	
SAMPLE ID	DASS115A-0002	DASB115-0305	DASB115A-0204	DASB010607	DASB010607-AVG	DASB010607-D
SAMPLE DATE	20110525	20100420	20110525	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SB	SB	SB
TOP DEPTH	0	3	2	4	4	4
BOTTOM DEPTH	2	5	4	5	5	5
VOLATILES (UG/KG)						
1,1,1,2-TETRACHLOROETHANE						
1,1,1-TRICHLOROETHANE						
1,1,2,2-TETRACHLOROETHANE						
1,1,2-TRICHLOROETHANE						
1,1,2-TRICHLOROTRIFLUOROETHANE						
1,1-DICHLOROETHANE						
1,1-DICHLOROETHENE						
1,1-DICHLOROPROPENE						
1,2,3-TRICHLOROBENZENE						
1,2,3-TRICHLOROPROPANE						
1,2,3-TRIMETHYLBENZENE						
1,2,4-TRICHLOROBENZENE						
1,2,4-TRIMETHYLBENZENE						
1,2-DIBROMO-3-CHLOROPROPANE						
1,2-DIBROMOETHANE						
1,2-DICHLOROBENZENE						
1,2-DICHLOROETHANE						
1,2-DICHLOROPROPANE						
1,3,5-TRIMETHYLBENZENE						
1,3-DICHLOROBENZENE						
1,3-DICHLOROPROPANE						
1,4-DICHLOROBENZENE						
2,2-DICHLOROPROPANE						
2-BUTANONE						
2-CHLOROETHYL VINYL ETHER						
2-CHLOROTOLUENE						
2-HEXANONE						
2-METHYLNAPHTHALENE						
2-NITROPROPANE						
4-CHLOROTOLUENE						
4-ISOPROPYLTOLUENE						
4-METHYL-2-PENTANONE						
ACETONE						
ACRYLONITRILE						
BENZENE				6.3 U	6.3 U	
BROMOBENZENE						
BROMOCHLOROMETHANE						
BROMODICHLOROMETHANE						
BROMOFORM						
BROMOMETHANE						
CARBON DISULFIDE						
CARBON TETRACHLORIDE						
CHLOROBENZENE						
CHLORODIBROMOMETHANE						
CHLOROETHANE						
CHLOROFORM						
CHLOROMETHANE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASS115A	DASB115	DASB115A	DASB01		
SAMPLE ID	DASS115A-0002	DASB115-0305	DASB115A-0204	DASB010607	DASB010607-AVG	DASB010607-D
SAMPLE DATE	20110525	20100420	20110525	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
MATRIX	SO	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SS	SB	SB	SB	SB	SB
TOP DEPTH	0	3	2	4	4	4
BOTTOM DEPTH	2	5	4	5	5	5
CIS-1,2-DICHLOROETHENE						
CIS-1,3-DICHLOROPROPENE						
DIBROMOMETHANE						
DICHLORODIFLUOROMETHANE						
DIETHYL ETHER						
DIISOPROPYL ETHER						
ETHYL METHACRYLATE						
ETHYL TERT-BUTYL ETHER						
ETHYLBENZENE				6.3 U	6.3 U	
HEXACHLOROBUTADIENE						
HEXACHLOROETHANE						
ISOPROPYLBENZENE						
M+P-XYLENES						
METHYL IODIDE						
METHYL TERT-BUTYL ETHER				6.3 U	6.3 U	
METHYLENE CHLORIDE						
NAPHTHALENE						
N-BUTYLBENZENE						
N-PROPYLBENZENE						
O-XYLENE						
SEC-BUTYLBENZENE						
STYRENE						
TERT-AMYL METHYL ETHER						
TERT-BUTYLBENZENE						
TERTIARY-BUTYL ALCOHOL						
TETRACHLOROETHENE						
TOLUENE				6.3 U	6.3 U	
TOTAL XYLENES				19 U	19 U	
TRANS-1,2-DICHLOROETHENE						
TRANS-1,3-DICHLOROPROPENE						
TRANS-1,4-DICHLORO-2-BUTENE						
TRICHLOROETHENE						
TRICHLOROFLUOROMETHANE						
VINYL CHLORIDE						

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB02	DASB03	DASB06	DASB07	
SAMPLE ID	DASB020607	DASB030406	DASB061112	DASB070304	DASB080304
SAMPLE DATE	20020814	20020814	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	4.5	1	8.5	1	2
BOTTOM DEPTH	5.5	3	9	2	3
METALS (MG/KG)					
ARSENIC				10.2	13.7
BARIUM				459	251
CADMIUM				0.35	0.32
CHROMIUM				7.3	8.7
COPPER					
LEAD	91.1	454	10.7	1070	401
MERCURY				0.45	0.98
SELENIUM				1.8	3.6
SILVER				0.07	0.21
ZINC					
MISCELLANEOUS PARAMETERS (%)					
PERCENT MOISTURE					
PERCENT SOLIDS	78.7	80.8	72.9	84.4	78.8
TOTAL SOLIDS					
PESTICIDES/PCBS (UG/KG)					
4,4'-DDD				39 U	210 U
4,4'-DDE				39 U	210 U
4,4'-DDT				39 U	210 U
ALDRIN				19 U	110 U
ALPHA-BHC				19 U	110 U
ALPHA-CHLORDANE				19 U	110 U
AROCLOR-1016				780 U	840 U
AROCLOR-1221				780 U	840 U
AROCLOR-1232				780 U	840 U
AROCLOR-1242				780 U	840 U
AROCLOR-1248				780 U	840 U
AROCLOR-1254				780 U	840 U
AROCLOR-1260				780 U	840 U
BETA-BHC				19 U	110 U
CHLORDANE (TECHNICAL)				190 U	1100 U
DELTA-BHC				19 U	110 U
DIELDRIN				19 U	110 U
ENDOSULFAN I				19 U	110 U
ENDOSULFAN II				39 U	210 U
ENDOSULFAN SULFATE				39 U	210 U
ENDRIN				39 U	210 U
ENDRIN ALDEHYDE				39 U	210 U
ENDRIN KETONE				39 U	210 U
GAMMA-BHC (LINDANE)				19 U	110 U
GAMMA-CHLORDANE				19 U	110 U
HEPTACHLOR				19 U	110 U
HEPTACHLOR EPOXIDE				19 U	110 U
METHOXYCHLOR				39 U	210 U
TOXAPHENE				1900 U	11000 U

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB02	DASB03	DASB06	DASB07	
SAMPLE ID	DASB020607	DASB030406	DASB061112	DASB070304	DASB080304
SAMPLE DATE	20020814	20020814	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	4.5	1	8.5	1	2
BOTTOM DEPTH	5.5	3	9	2	3
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
2-METHYLNAPHTHALENE					
ACENAPHTHENE					
ACENAPHTHYLENE					
ANTHRACENE					
BAP EQUIVALENT-HALFND					
BAP EQUIVALENT-POS					
BENZO(A)ANTHRACENE					
BENZO(A)PYRENE					
BENZO(B)FLUORANTHENE					
BENZO(G,H,I)PERYLENE					
BENZO(K)FLUORANTHENE					
CHRYSENE					
DIBENZO(A,H)ANTHRACENE					
FLUORANTHENE					
FLUORENE					
INDENO(1,2,3-CD)PYRENE					
NAPHTHALENE					
PHENANTHRENE					
PYRENE					
SEMIVOLATILES (UG/KG)					
1,2,4-TRICHLOROBENZENE				200 U	210 U
1,2-DICHLOROBENZENE				200 U	210 U
1,3-DICHLOROBENZENE				200 U	210 U
1,4-DICHLOROBENZENE				200 U	210 U
2,2'-OXYBIS(1-CHLOROPROPANE)				200 U	210 U
2,4,5-TRICHLOROPHENOL				200 U	210 U
2,4,6-TRICHLOROPHENOL				200 U	210 U
2,4-DICHLOROPHENOL				200 U	210 U
2,4-DIMETHYLPHENOL				45.6 J	210 U
2,4-DINITROPHENOL				980 U	1100 U
2,4-DINITROTOLUENE				200 U	210 U
2,6-DINITROTOLUENE				200 U	210 U
2-CHLORONAPHTHALENE				200 U	210 U
2-CHLOROPHENOL				200 U	210 U
2-METHYLNAPHTHALENE	210 U	200 U		488	75.6 J
2-METHYLPHENOL				200 U	210 U
2-NITROANILINE				390 U	420 U
2-NITROPHENOL				200 U	210 U
3&4-METHYLPHENOL				45.2 J	210 U
3,3'-DICHLOROBENZIDINE				390 U	420 U
3-NITROANILINE				390 U	420 U
4,6-DINITRO-2-METHYLPHENOL				390 U	420 U
4-BROMOPHENYL PHENYL ETHER				200 U	210 U
4-CHLORO-3-METHYLPHENOL				200 U	210 U

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB02	DASB03	DASB06	DASB07	
SAMPLE ID	DASB020607	DASB030406	DASB061112	DASB070304	DASB080304
SAMPLE DATE	20020814	20020814	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	4.5	1	8.5	1	2
BOTTOM DEPTH	5.5	3	9	2	3
4-CHLOROANILINE				390 U	420 U
4-CHLOROPHENYL PHENYL ETHER				200 U	210 U
4-NITROANILINE				390 U	420 U
4-NITROPHENOL				980 U	1100 U
ACENAPHTHENE	42.7 J	200 U		1350	97.2 J
ACENAPHTHYLENE	210 U	480		298	73.5 J
ANTHRACENE	61.1 J	261		2370	340
BAP EQUIVALENT-HALFND	274.526	1663.578		6328.02	1022.623
BAP EQUIVALENT-POS	159.026	1663.578		6328.02	1022.623
BENZO(A)ANTHRACENE	149 J	812		4810	807
BENZO(A)PYRENE	128 J	1160		4510	711
BENZO(B)FLUORANTHENE	154 J	865		5030	804
BENZO(G,H,I)PERYLENE	85.8 J	1180		4080	401
BENZO(K)FLUORANTHENE	58 J	308		1740	267
BIS(2-CHLOROETHOXY)METHANE				200 U	210 U
BIS(2-CHLOROETHYL)ETHER				200 U	210 U
BIS(2-ETHYLHEXYL)PHTHALATE				390 U	420 U
BUTYL BENZYL PHTHALATE				390 U	420 U
CARBAZOLE				645	90.6 J
CHRYSENE	146 J	898		4620	753
DIBENZO(A,H)ANTHRACENE	210 U	233		451	99.7 J
DIBENZOFURAN				647	75.2 J
DIETHYL PHTHALATE				390 U	420 U
DIMETHYL PHTHALATE				390 U	420 U
DI-N-BUTYL PHTHALATE				390 U	420 U
DI-N-OCTYL PHTHALATE				390 U	420 U
FLUORANTHENE	321	875		11100	1940
FLUORENE	210 U	200 U		1660	128 J
HEXACHLOROBENZENE				200 U	210 U
HEXACHLOROBUTADIENE				200 U	210 U
HEXACHLOROCYCLOPENTADIENE				200 U	210 U
HEXACHLOROETHANE				200 U	210 U
INDENO(1,2,3-CD)PYRENE	210 U	989		3610	474
ISOPHORONE				200 U	210 U
NAPHTHALENE	210 U	44.2 J		1860	45.1 J
NITROBENZENE				200 U	210 U
N-NITROSO-DI-N-PROPYLAMINE				200 U	210 U
N-NITROSODIPHENYLAMINE				200 U	210 U
PENTACHLOROPHENOL				980 U	1100 U
PHENANTHRENE	209 J	356		8430	1220
PHENOL				200 U	210 U
PYRENE	287	1360		10800	1150

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB02	DASB03	DASB06	DASB07	
SAMPLE ID	DASB020607	DASB030406	DASB061112	DASB070304	DASB080304
SAMPLE DATE	20020814	20020814	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	4.5	1	8.5	1	2
BOTTOM DEPTH	5.5	3	9	2	3
VOLATILES (UG/KG)					
1,1,1,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE				6.9 U	10 U
1,1,2,2-TETRACHLOROETHANE				6.9 U	10 U
1,1,2-TRICHLOROETHANE				6.9 U	10 U
1,1,2-TRICHLOROTRIFLUOROETHANE					
1,1-DICHLOROETHANE				6.9 U	10 U
1,1-DICHLOROETHENE				6.9 U	10 U
1,1-DICHLOROPROPENE					
1,2,3-TRICHLOROBENZENE					
1,2,3-TRICHLOROPROPANE					
1,2,3-TRIMETHYLBENZENE					
1,2,4-TRICHLOROBENZENE					
1,2,4-TRIMETHYLBENZENE					
1,2-DIBROMO-3-CHLOROPROPANE					
1,2-DIBROMOETHANE					
1,2-DICHLOROBENZENE				6.9 U	10 U
1,2-DICHLOROETHANE				6.9 U	10 U
1,2-DICHLOROPROPANE				6.9 U	10 U
1,3,5-TRIMETHYLBENZENE					
1,3-DICHLOROBENZENE				6.9 U	10 U
1,3-DICHLOROPROPANE					
1,4-DICHLOROBENZENE				6.9 U	10 U
2,2-DICHLOROPROPANE					
2-BUTANONE				34 U	21.1 J
2-CHLOROETHYL VINYL ETHER					
2-CHLOROTOLUENE					
2-HEXANONE				34 U	52 U
2-METHYLNAPHTHALENE					
2-NITROPROPANE					
4-CHLOROTOLUENE					
4-ISOPROPYLTOLUENE					
4-METHYL-2-PENTANONE				34 U	52 U
ACETONE				45.6 J	92.9 J
ACRYLONITRILE					
BENZENE	6.9 U	7.1 U	7.8 U	6.9 U	10 U
BROMOBENZENE					
BROMOCHLOROMETHANE					
BROMODICHLOROMETHANE				6.9 U	10 U
BROMOFORM				6.9 U	10 U
BROMOMETHANE				6.9 U	10 U
CARBON DISULFIDE				6.9 U	10 U
CARBON TETRACHLORIDE				6.9 U	10 U
CHLOROBENZENE				6.9 U	10 U
CHLORODIBROMOMETHANE				6.9 U	10 U
CHLOROETHANE				6.9 U	10 U
CHLOROFORM				6.9 U	10 U
CHLOROMETHANE				6.9 U	10 U

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB02	DASB03	DASB06	DASB07	
SAMPLE ID	DASB020607	DASB030406	DASB061112	DASB070304	DASB080304
SAMPLE DATE	20020814	20020814	20020814	20020814	20020814
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	4.5	1	8.5	1	2
BOTTOM DEPTH	5.5	3	9	2	3
CIS-1,2-DICHLOROETHENE				6.9 U	10 U
CIS-1,3-DICHLOROPROPENE				6.9 U	10 U
DIBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
DIETHYL ETHER				34 U	52 U
DIISOPROPYL ETHER					
ETHYL METHACRYLATE					
ETHYL TERT-BUTYL ETHER					
ETHYLBENZENE	6.9 U	7.1 U	7.8 U	6.9 U	10 U
HEXACHLOROBUTADIENE					
HEXACHLOROETHANE					
ISOPROPYLBENZENE					
M+P-XYLENES					
METHYL IODIDE					
METHYL TERT-BUTYL ETHER	6.9 U	7.1 U	7.8 U	6.9 U	10 U
METHYLENE CHLORIDE				14 U	21 U
NAPHTHALENE					
N-BUTYLBENZENE					
N-PROPYLBENZENE					
O-XYLENE					
SEC-BUTYLBENZENE					
STYRENE				6.9 U	10 U
TERT-AMYL METHYL ETHER					
TERT-BUTYLBENZENE					
TERTIARY-BUTYL ALCOHOL					
TETRACHLOROETHENE				6.9 U	10 U
TOLUENE	6.9 U	7.1 U	7.8 U	6.9 U	10 U
TOTAL XYLENES	21 U	21 U	23 U	21 U	31 U
TRANS-1,2-DICHLOROETHENE				6.9 U	10 U
TRANS-1,3-DICHLOROPROPENE				6.9 U	10 U
TRANS-1,4-DICHLORO-2-BUTENE					
TRICHLOROETHENE				6.9 U	10 U
TRICHLOROFLUOROMETHANE				6.9 U	10 U
VINYL CHLORIDE				6.9 U	10 U

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB08		DASB09	EMSB14	
SAMPLE ID	DASB080304-AVG	DASB080304-D	DASB090304	DASB14_04-05.5	DASB14_09-10.5
SAMPLE DATE	20020814	20020814	20020814	20060425	20060425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	2	2	1	4	9
BOTTOM DEPTH	3	3	2	5.5	10.5
METALS (MG/KG)					
ARSENIC	13.45	13.2	23.9	11	7.8
BARIUM	435	619	122	440	110
CADMIUM	0.315	0.31	0.3	0.6	0.53
CHROMIUM	8.45	8.2	10.4	15	16
COPPER				99	36
LEAD	539	677	338	510	120
MERCURY	0.665	0.35	1.1	0.28	0.14
SELENIUM	6.15	8.7	3.8	0.63	0.48 U
SILVER	0.225	0.24	0.2	0.3	0.17 J
ZINC				380	120
MISCELLANEOUS PARAMETERS (%)					
PERCENT MOISTURE				18	21
PERCENT SOLIDS	83.05	87.3	83.1		
TOTAL SOLIDS					
PESTICIDES/PCBS (UG/KG)					
4,4'-DDD	210 U		4 U		
4,4'-DDE	210 U		4 U		
4,4'-DDT	210 U		4 U		
ALDRIN	110 U		2 U		
ALPHA-BHC	110 U		2 U		
ALPHA-CHLORDANE	110 U		2 U		
AROCLOR-1016	840 U		800 U		
AROCLOR-1221	840 U		800 U		
AROCLOR-1232	840 U		800 U		
AROCLOR-1242	840 U		800 U		
AROCLOR-1248	840 U		800 U		
AROCLOR-1254	840 U		800 U		
AROCLOR-1260	840 U		800 U		
BETA-BHC	110 U		2 U		
CHLORDANE (TECHNICAL)	1100 U		20 U		
DELTA-BHC	110 U		2 U		
DIELDRIN	110 U		2 U		
ENDOSULFAN I	110 U		2 U		
ENDOSULFAN II	210 U		4 U		
ENDOSULFAN SULFATE	210 U		4 U		
ENDRIN	210 U		4 U		
ENDRIN ALDEHYDE	210 U		4 U		
ENDRIN KETONE	210 U		4 U		
GAMMA-BHC (LINDANE)	110 U		2 U		
GAMMA-CHLORDANE	110 U		2 U		
HEPTACHLOR	110 U		2 U		
HEPTACHLOR EPOXIDE	110 U		2 U		
METHOXYCHLOR	210 U		4 U		
TOXAPHENE	11000 U		200 U		

LOCATION	DASB08		DASB09	EMSB14	
SAMPLE ID	DASB080304-AVG	DASB080304-D	DASB090304	DASB14_04-05.5	DASB14_09-10.5
SAMPLE DATE	20020814	20020814	20020814	20060425	20060425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	2	2	1	4	9
BOTTOM DEPTH	3	3	2	5.5	10.5
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
2-METHYLNAPHTHALENE				210 J	37 J
ACENAPHTHENE				1700 J	48 J
ACENAPHTHYLENE				2400 U	420 U
ANTHRACENE				3000	110 J
BAP EQUIVALENT-HALFND				4365.9	342.93
BAP EQUIVALENT-POS				3165.9	132.93
BENZO(A)ANTHRACENE				2900	130 J
BENZO(A)PYRENE				2400	99 J
BENZO(B)FLUORANTHENE				3200	140 J
BENZO(G,H,I)PERYLENE				1400 J	51 J
BENZO(K)FLUORANTHENE				1200 J	63 J
CHRYSENE				3900	200 J
DIBENZO(A,H)ANTHRACENE				2400 U	420 U
FLUORANTHENE				9200	380 J
FLUORENE				2900	71 J
INDENO(1,2,3-CD)PYRENE				1400 J	61 J
NAPHTHALENE				330 J	77 J
PHENANTHRENE				14000	460
PYRENE				7500	320 J
SEMIVOLATILES (UG/KG)					
1,2,4-TRICHLOROBENZENE	210 U		200 U		
1,2-DICHLOROBENZENE	210 U		200 U		
1,3-DICHLOROBENZENE	210 U		200 U		
1,4-DICHLOROBENZENE	210 U		200 U		
2,2'-OXYBIS(1-CHLOROPROPANE)	210 U		200 U		
2,4,5-TRICHLOROPHENOL	210 U		200 U		
2,4,6-TRICHLOROPHENOL	210 U		200 U		
2,4-DICHLOROPHENOL	210 U		200 U		
2,4-DIMETHYLPHENOL	210 U		200 U		
2,4-DINITROPHENOL	1100 U		980 U		
2,4-DINITROTOLUENE	210 U		200 U		
2,6-DINITROTOLUENE	210 U		200 U		
2-CHLORONAPHTHALENE	210 U		200 U		
2-CHLOROPHENOL	210 U		200 U		
2-METHYLNAPHTHALENE	75.6 J		200 U		
2-METHYLPHENOL	210 U		200 U		
2-NITROANILINE	420 U		390 U		
2-NITROPHENOL	210 U		200 U		
3&4-METHYLPHENOL	210 U		200 U		
3,3'-DICHLOROBENZIDINE	420 U		390 U		
3-NITROANILINE	420 U		390 U		
4,6-DINITRO-2-METHYLPHENOL	420 U		390 U		
4-BROMOPHENYL PHENYL ETHER	210 U		200 U		
4-CHLORO-3-METHYLPHENOL	210 U		200 U		

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB08		DASB09	EMSB14	
SAMPLE ID	DASB080304-AVG	DASB080304-D	DASB090304	DASB14_04-05.5	DASB14_09-10.5
SAMPLE DATE	20020814	20020814	20020814	20060425	20060425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	2	2	1	4	9
BOTTOM DEPTH	3	3	2	5.5	10.5
4-CHLOROANILINE	420 U		390 U		
4-CHLOROPHENYL PHENYL ETHER	210 U		200 U		
4-NITROANILINE	420 U		390 U		
4-NITROPHENOL	1100 U		980 U		
ACENAPHTHENE	97.2 J		46.6 J		
ACENAPHTHYLENE	73.5 J		69.6 J		
ANTHRACENE	340		166 J		
BAP EQUIVALENT-HALFND	1022.623		859.756		
BAP EQUIVALENT-POS	1022.623		859.756		
BENZO(A)ANTHRACENE	807		650		
BENZO(A)PYRENE	711		594		
BENZO(B)FLUORANTHENE	804		673		
BENZO(G,H,I)PERYLENE	401		339		
BENZO(K)FLUORANTHENE	267		209		
BIS(2-CHLOROETHOXY)METHANE	210 U		200 U		
BIS(2-CHLOROETHYL)ETHER	210 U		200 U		
BIS(2-ETHYLHEXYL)PHTHALATE	420 U		390 U		
BUTYL BENZYL PHTHALATE	420 U		390 U		
CARBAZOLE	90.6 J		54.5 J		
CHRYSENE	753		666		
DIBENZO(A,H)ANTHRACENE	99.7 J		92.5 J		
DIBENZOFURAN	75.2 J		200 U		
DIETHYL PHTHALATE	420 U		390 U		
DIMETHYL PHTHALATE	420 U		390 U		
DI-N-BUTYL PHTHALATE	420 U		390 U		
DI-N-OCTYL PHTHALATE	420 U		390 U		
FLUORANTHENE	1940		1370		
FLUORENE	128 J		59 J		
HEXACHLOROBENZENE	210 U		200 U		
HEXACHLOROBUTADIENE	210 U		200 U		
HEXACHLOROCYCLOPENTADIENE	210 U		200 U		
HEXACHLOROETHANE	210 U		200 U		
INDENO(1,2,3-CD)PYRENE	474		382		
ISOPHORONE	210 U		200 U		
NAPHTHALENE	45.1 J		200 U		
NITROBENZENE	210 U		200 U		
N-NITROSO-DI-N-PROPYLAMINE	210 U		200 U		
N-NITROSODIPHENYLAMINE	210 U		200 U		
PENTACHLOROPHENOL	1100 U		980 U		
PHENANTHRENE	1220		573		
PHENOL	210 U		200 U		
PYRENE	1150		830		

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB08		DASB09	EMSB14	
SAMPLE ID	DASB080304-AVG	DASB080304-D	DASB090304	DASB14_04-05.5	DASB14_09-10.5
SAMPLE DATE	20020814	20020814	20020814	20060425	20060425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	2	2	1	4	9
BOTTOM DEPTH	3	3	2	5.5	10.5
VOLATILES (UG/KG)					
1,1,1,2-TETRACHLOROETHANE					
1,1,1-TRICHLOROETHANE	210 U	410 U	250 U		
1,1,2,2-TETRACHLOROETHANE	210 U	410 U	250 U		
1,1,2-TRICHLOROETHANE	210 U	410 U	250 U		
1,1,2-TRICHLOROTRIFLUOROETHANE					
1,1-DICHLOROETHANE	210 U	410 U	250 U		
1,1-DICHLOROETHENE	210 U	410 U	250 U		
1,1-DICHLOROPROPENE					
1,2,3-TRICHLOROBENZENE					
1,2,3-TRICHLOROPROPANE					
1,2,3-TRIMETHYLBENZENE					
1,2,4-TRICHLOROBENZENE					
1,2,4-TRIMETHYLBENZENE					
1,2-DIBROMO-3-CHLOROPROPANE					
1,2-DIBROMOETHANE					
1,2-DICHLOROBENZENE	210 U	410 U	250 U		
1,2-DICHLOROETHANE	210 U	410 U	250 U		
1,2-DICHLOROPROPANE	210 U	410 U	250 U		
1,3,5-TRIMETHYLBENZENE					
1,3-DICHLOROBENZENE	210 U	410 U	250 U		
1,3-DICHLOROPROPANE					
1,4-DICHLOROBENZENE	210 U	410 U	250 U		
2,2-DICHLOROPROPANE					
2-BUTANONE	21.1 J	2100 U	1300 U		
2-CHLOROETHYL VINYL ETHER					
2-CHLOROTOLUENE					
2-HEXANONE	1076 U	2100 U	1300 U		
2-METHYLNAPHTHALENE					
2-NITROPROPANE					
4-CHLOROTOLUENE					
4-ISOPROPYLTOLUENE					
4-METHYL-2-PENTANONE	1076 U	2100 U	1300 U		
ACETONE	92.9 J	4100 U	2500 U		
ACRYLONITRILE					
BENZENE	210 U	410 U	250 U		
BROMOBENZENE					
BROMOCHLOROMETHANE					
BROMODICHLOROMETHANE	210 U	410 U	250 U		
BROMOFORM	210 U	410 U	250 U		
BROMOMETHANE	210 U	410 U	250 U		
CARBON DISULFIDE	210 U	410 U	250 U		
CARBON TETRACHLORIDE	210 U	410 U	250 U		
CHLOROBENZENE	210 U	410 U	250 U		
CHLORODIBROMOMETHANE	210 U	410 U	250 U		
CHLOROETHANE	210 U	410 U	250 U		
CHLOROFORM	210 U	410 U	250 U		
CHLOROMETHANE	210 U	410 U	250 U		

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	DASB08		DASB09	EMSB14	
SAMPLE ID	DASB080304-AVG	DASB080304-D	DASB090304	DASB14_04-05.5	DASB14_09-10.5
SAMPLE DATE	20020814	20020814	20020814	20060425	20060425
SAMPLE CODE	AVG	DUP	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB	SB
TOP DEPTH	2	2	1	4	9
BOTTOM DEPTH	3	3	2	5.5	10.5
CIS-1,2-DICHLOROETHENE	210 U	410 U	250 U		
CIS-1,3-DICHLOROPROPENE	210 U	410 U	250 U		
DIBROMOMETHANE					
DICHLORODIFLUOROMETHANE					
DIETHYL ETHER	1076 U	2100 U	1300 U		
DIISOPROPYL ETHER					
ETHYL METHACRYLATE					
ETHYL TERT-BUTYL ETHER					
ETHYLBENZENE	210 U	410 U	250 U		
HEXACHLOROBUTADIENE					
HEXACHLOROETHANE					
ISOPROPYLBENZENE					
M+P-XYLENES					
METHYL IODIDE					
METHYL TERT-BUTYL ETHER	210 U	410 U	250 U		
METHYLENE CHLORIDE	420.5 U	820 U	500 U		
NAPHTHALENE					
N-BUTYLBENZENE					
N-PROPYLBENZENE					
O-XYLENE					
SEC-BUTYLBENZENE					
STYRENE	210 U	410 U	250 U		
TERT-AMYL METHYL ETHER					
TERT-BUTYLBENZENE					
TERTIARY-BUTYL ALCOHOL					
TETRACHLOROETHENE	210 U	410 U	250 U		
TOLUENE	210 U	410 U	250 U		
TOTAL XYLENES	615.5 U	1200 U	750 U		
TRANS-1,2-DICHLOROETHENE	210 U	410 U	250 U		
TRANS-1,3-DICHLOROPROPENE	210 U	410 U	250 U		
TRANS-1,4-DICHLORO-2-BUTENE					
TRICHLOROETHENE	210 U	410 U	250 U		
TRICHLOROFLUOROMETHANE	210 U	410 U	250 U		
VINYL CHLORIDE	210 U	410 U	250 U		

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	EMSB15	EMSB16	EMSB17	EMSB18
SAMPLE ID	DASB15_01.5-03	DASB16_04-05.5	DASB17_01.5-03	DASB18_06.5-08
SAMPLE DATE	20060425	20060425	20060425	20060425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	1.5	4	1.5	6.5
BOTTOM DEPTH	3	5.5	3	8
METALS (MG/KG)				
ARSENIC	6.3	7.5	8.4	7
BARIUM	67	55	92	57
CADMIUM	0.54	0.45	0.67	0.37 J
CHROMIUM	15	12	18	14
COPPER	82	110	68	26
LEAD	66	57	260	85
MERCURY	0.17	1.1	0.21	0.73
SELENIUM	0.85	0.42 J	0.64	0.88
SILVER	0.074 J	0.14 J	0.13 J	0.16 J
ZINC	110	85	130	61
MISCELLANEOUS PARAMETERS (%)				
PERCENT MOISTURE	12	15	16	19
PERCENT SOLIDS				
TOTAL SOLIDS				
PESTICIDES/PCBS (UG/KG)				
4,4'-DDD				
4,4'-DDE				
4,4'-DDT				
ALDRIN				
ALPHA-BHC				
ALPHA-CHLORDANE				
AROCLOR-1016				
AROCLOR-1221				
AROCLOR-1232				
AROCLOR-1242				
AROCLOR-1248				
AROCLOR-1254				
AROCLOR-1260				
BETA-BHC				
CHLORDANE (TECHNICAL)				
DELTA-BHC				
DIELDRIN				
ENDOSULFAN I				
ENDOSULFAN II				
ENDOSULFAN SULFATE				
ENDRIN				
ENDRIN ALDEHYDE				
ENDRIN KETONE				
GAMMA-BHC (LINDANE)				
GAMMA-CHLORDANE				
HEPTACHLOR				
HEPTACHLOR EPOXIDE				
METHOXYCHLOR				
TOXAPHENE				

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	EMSB15	EMSB16	EMSB17	EMSB18
SAMPLE ID	DASB15_01.5-03	DASB16_04-05.5	DASB17_01.5-03	DASB18_06.5-08
SAMPLE DATE	20060425	20060425	20060425	20060425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	1.5	4	1.5	6.5
BOTTOM DEPTH	3	5.5	3	8
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)				
2-METHYLNAPHTHALENE	370 U	42 J	430 J	2000 U
ACENAPHTHENE	370 U	390 U	440 J	720 J
ACENAPHTHYLENE	370 U	390 U	550 J	610 J
ANTHRACENE	370 U	38 J	1400 J	2800
BAP EQUIVALENT-HALFND	259.114	358.81	4098.7	7848.6
BAP EQUIVALENT-POS	53.764	161.86	4098.7	7848.6
BENZO(A)ANTHRACENE	46 J	170 J	4000	6600
BENZO(A)PYRENE	43 J	120 J	2700	5500
BENZO(B)FLUORANTHENE	61 J	190 J	3900	6800
BENZO(G,H,I)PERYLENE	370 U	60 J	1200 J	2200
BENZO(K)FLUORANTHENE	370 U	390 U	1500 J	3200
CHRYSENE	64 J	160 J	3700	6600
DIBENZO(A,H)ANTHRACENE	370 U	390 U	470 J	730 J
FLUORANTHENE	120 J	340 J	7700	17000
FLUORENE	370 U	390 U	1000 J	1200 J
INDENO(1,2,3-CD)PYRENE	370 U	57 J	1200 J	2400
NAPHTHALENE	370 U	47 J	330 J	480 J
PHENANTHRENE	88 J	220 J	7500	5500
PYRENE	100 J	260 J	6800	14000
SEMIVOLATILES (UG/KG)				
1,2,4-TRICHLOROBENZENE				
1,2-DICHLOROBENZENE				
1,3-DICHLOROBENZENE				
1,4-DICHLOROBENZENE				
2,2'-OXYBIS(1-CHLOROPROPANE)				
2,4,5-TRICHLOROPHENOL				
2,4,6-TRICHLOROPHENOL				
2,4-DICHLOROPHENOL				
2,4-DIMETHYLPHENOL				
2,4-DINITROPHENOL				
2,4-DINITROTOLUENE				
2,6-DINITROTOLUENE				
2-CHLORONAPHTHALENE				
2-CHLOROPHENOL				
2-METHYLNAPHTHALENE				
2-METHYLPHENOL				
2-NITROANILINE				
2-NITROPHENOL				
3&4-METHYLPHENOL				
3,3'-DICHLOROBENZIDINE				
3-NITROANILINE				
4,6-DINITRO-2-METHYLPHENOL				
4-BROMOPHENYL PHENYL ETHER				
4-CHLORO-3-METHYLPHENOL				

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	EMSB15	EMSB16	EMSB17	EMSB18
SAMPLE ID	DASB15_01.5-03	DASB16_04-05.5	DASB17_01.5-03	DASB18_06.5-08
SAMPLE DATE	20060425	20060425	20060425	20060425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	1.5	4	1.5	6.5
BOTTOM DEPTH	3	5.5	3	8
4-CHLOROANILINE				
4-CHLOROPHENYL PHENYL ETHER				
4-NITROANILINE				
4-NITROPHENOL				
ACENAPHTHENE				
ACENAPHTHYLENE				
ANTHRACENE				
BAP EQUIVALENT-HALFND				
BAP EQUIVALENT-POS				
BENZO(A)ANTHRACENE				
BENZO(A)PYRENE				
BENZO(B)FLUORANTHENE				
BENZO(G,H,I)PERYLENE				
BENZO(K)FLUORANTHENE				
BIS(2-CHLOROETHOXY)METHANE				
BIS(2-CHLOROETHYL)ETHER				
BIS(2-ETHYLHEXYL)PHTHALATE				
BUTYL BENZYL PHTHALATE				
CARBAZOLE				
CHRYSENE				
DIBENZO(A,H)ANTHRACENE				
DIBENZOFURAN				
DIETHYL PHTHALATE				
DIMETHYL PHTHALATE				
DI-N-BUTYL PHTHALATE				
DI-N-OCTYL PHTHALATE				
FLUORANTHENE				
FLUORENE				
HEXACHLOROBENZENE				
HEXACHLOROBUTADIENE				
HEXACHLOROCYCLOPENTADIENE				
HEXACHLOROETHANE				
INDENO(1,2,3-CD)PYRENE				
ISOPHORONE				
NAPHTHALENE				
NITROBENZENE				
N-NITROSO-DI-N-PROPYLAMINE				
N-NITROSODIPHENYLAMINE				
PENTACHLOROPHENOL				
PHENANTHRENE				
PHENOL				
PYRENE				

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	EMSB15	EMSB16	EMSB17	EMSB18
SAMPLE ID	DASB15_01.5-03	DASB16_04-05.5	DASB17_01.5-03	DASB18_06.5-08
SAMPLE DATE	20060425	20060425	20060425	20060425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	1.5	4	1.5	6.5
BOTTOM DEPTH	3	5.5	3	8
VOLATILES (UG/KG)				
1,1,1,2-TETRACHLOROETHANE	57 U			
1,1,1-TRICHLOROETHANE	57 U			
1,1,2,2-TETRACHLOROETHANE	57 U			
1,1,2-TRICHLOROETHANE	57 U			
1,1,2-TRICHLOROTRIFLUOROETHANE	57 U			
1,1-DICHLOROETHANE	57 U			
1,1-DICHLOROETHENE	57 U			
1,1-DICHLOROPROPENE	57 U			
1,2,3-TRICHLOROBENZENE	57 U			
1,2,3-TRICHLOROPROPANE	57 U			
1,2,3-TRIMETHYLBENZENE	57 U			
1,2,4-TRICHLOROBENZENE	280 U			
1,2,4-TRIMETHYLBENZENE	57 U			
1,2-DIBROMO-3-CHLOROPROPANE	57 U			
1,2-DIBROMOETHANE	57 U			
1,2-DICHLOROBENZENE	57 U			
1,2-DICHLOROETHANE	57 U			
1,2-DICHLOROPROPANE	57 U			
1,3,5-TRIMETHYLBENZENE	57 U			
1,3-DICHLOROBENZENE	57 U			
1,3-DICHLOROPROPANE	57 U			
1,4-DICHLOROBENZENE	57 U			
2,2-DICHLOROPROPANE	57 U			
2-BUTANONE	1800			
2-CHLOROETHYL VINYL ETHER	570 U			
2-CHLOROTOLUENE	57 U			
2-HEXANONE	2800 U			
2-METHYLNAPHTHALENE	280 U			
2-NITROPROPANE	230 U			
4-CHLOROTOLUENE	57 U			
4-ISOPROPYLTOLUENE	57 U			
4-METHYL-2-PENTANONE	570 U			
ACETONE	150 J			
ACRYLONITRILE	280 U			
BENZENE	57 U			
BROMOBENZENE	57 U			
BROMOCHLOROMETHANE	57 U			
BROMODICHLOROMETHANE	57 U			
BROMOFORM	57 U			
BROMOMETHANE	280 U			
CARBON DISULFIDE	280 U			
CARBON TETRACHLORIDE	57 U			
CHLOROBENZENE	57 U			
CHLORODIBROMOMETHANE	57 U			
CHLOROETHANE	280 U			
CHLOROFORM	57 U			
CHLOROMETHANE	57 U			

TABLE B-1

FULL APPENDIX DATA
SITE INVESTIGATION REPORT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

LOCATION	EMSB15	EMSB16	EMSB17	EMSB18
SAMPLE ID	DASB15_01.5-03	DASB16_04-05.5	DASB17_01.5-03	DASB18_06.5-08
SAMPLE DATE	20060425	20060425	20060425	20060425
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO
SAMPLE TYPE	NORMAL	NORMAL	NORMAL	NORMAL
SUBMATRIX	SB	SB	SB	SB
TOP DEPTH	1.5	4	1.5	6.5
BOTTOM DEPTH	3	5.5	3	8
CIS-1,2-DICHLOROETHENE	57 U			
CIS-1,3-DICHLOROPROPENE	57 U			
DIBROMOMETHANE	57 U			
DICHLORODIFLUOROMETHANE	57 U			
DIETHYL ETHER	280 U			
DIISOPROPYL ETHER	280 U			
ETHYL METHACRYLATE	57 U			
ETHYL TERT-BUTYL ETHER	280 U			
ETHYLBENZENE	57 U			
HEXACHLOROBUTADIENE	280 U			
HEXACHLOROETHANE	57 U			
ISOPROPYLBENZENE	57 U			
M+P-XYLENES	110 U			
METHYL IODIDE	280 U			
METHYL TERT-BUTYL ETHER	280 U			
METHYLENE CHLORIDE	32 J			
NAPHTHALENE	280 U			
N-BUTYLBENZENE	57 U			
N-PROPYLBENZENE	57 U			
O-XYLENE	57 U			
SEC-BUTYLBENZENE	57 U			
STYRENE	57 U			
TERT-AMYL METHYL ETHER	230 U			
TERT-BUTYLBENZENE	57 U			
TERTIARY-BUTYL ALCOHOL	2300 U			
TETRACHLOROETHENE	57 U			
TOLUENE	57 U			
TOTAL XYLENES	170 U			
TRANS-1,2-DICHLOROETHENE	57 U			
TRANS-1,3-DICHLOROPROPENE	57 U			
TRANS-1,4-DICHLORO-2-BUTENE	57 U			
TRICHLOROETHENE	57 U			
TRICHLOROFLUOROMETHANE	57 U			
VINYL CHLORIDE	45 U			

LABORATORY REPORTS

SOIL – APRIL 2010

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB106-0002**	Sampled:	04/20/10 09:55
Lab Sample ID:	**1004372-01**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.4**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:06	DSC	1003935
Barium	**75**	0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 14:54	DSC	1003935
Cadmium	**0.33**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:06	DSC	1003935
Chromium	**14**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:06	DSC	1003935
Copper	**49**	0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:06	DSC	1003935
Lead	**99**	0.20	0.11	mg/kg dry wt.	2	USEPA-6020A	04/30/10 14:54	DSC	1003935
Mercury	**0.12**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 14:08	DSC	1004021
Selenium	**0.78**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:06	DSC	1003935
Silver	**0.11**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:06	DSC	1003935
Zinc	**88**	2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 14:54	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB106-0002**	Sampled:	04/20/10 09:55
Lab Sample ID:	**1004372-01**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB106-0305**	Sampled:	04/20/10 10:05
Lab Sample ID:	**1004372-02**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	92		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**5.5**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Barium	**48**		0.10	0.021	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Cadmium	**0.13**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Chromium	**15**		0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Copper	**13**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Lead	**8.5**		0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Mercury	**0.017**	J	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 14:13	DSC	1004021
Selenium	0.10	U	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Silver	**0.069**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935
Zinc	**38**		1.0	0.46	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:09	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB106-0305**	Sampled:	04/20/10 10:05
Lab Sample ID:	**1004372-02**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**92**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB102-0002**	Sampled:	04/20/10 10:30
Lab Sample ID:	**1004372-03**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**5.7**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Barium	**56**	0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 14:57	DSC	1003935
Cadmium	**0.27**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Chromium	**14**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Copper	**16**	0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Lead	**34**	0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Mercury	**0.071**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 14:18	DSC	1004021
Selenium	**0.18**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Silver	**0.072**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:12	DSC	1003935
Zinc	**62**	2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 14:57	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB102-0002**	Sampled:	04/20/10 10:30
Lab Sample ID:	**1004372-03**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB102-0305**	Sampled:	04/20/10 10:40
Lab Sample ID:	**1004372-04**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	86		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**16**	0.10	0.037	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:15	DSC	1003935
Barium	**82**	0.47	0.097	mg/kg dry wt.	5	USEPA-6020A	04/30/10 15:00	DSC	1003935
Cadmium	**0.21**	0.047	0.010	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:15	DSC	1003935
Chromium	**14**	0.10	0.053	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:15	DSC	1003935
Copper	**37**	0.10	0.073	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:15	DSC	1003935
Lead	**140**	0.47	0.25	mg/kg dry wt.	5	USEPA-6020A	04/30/10 15:00	DSC	1003935
Mercury	**0.25**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 14:34	DSC	1004021
Selenium	**0.33**	0.10	0.082	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:15	DSC	1003935
Silver	**0.098**	0.047	0.010	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:15	DSC	1003935
Zinc	**90**	4.7	2.2	mg/kg dry wt.	5	USEPA-6020A	04/30/10 15:00	DSC	1003935

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB102-0305**	Sampled:	04/20/10 10:40
Lab Sample ID:	**1004372-04**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**86**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB110-0002**	Sampled:	04/20/10 11:25
Lab Sample ID:	**1004372-05**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	91		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.1**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:19	DSC	1003935
***Barium**	**140**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:13	DSC	1003935
Cadmium	**1.3**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:19	DSC	1003935
***Chromium**	**11**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:19	DSC	1003935
***Copper**	**220**	1.0	0.78	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:13	DSC	1003935
***Lead**	**480**	2.0	1.1	mg/kg dry wt.	20	USEPA-6020A	04/30/10 15:03	DSC	1003935
***Mercury**	**0.82**	0.093	0.031	mg/kg dry wt.	2	USEPA-7471A	04/30/10 18:25	DSC	1004021
***Selenium**	**0.57**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:19	DSC	1003935
***Silver**	**0.23**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:19	DSC	1003935
***Zinc**	**660**	20	9.3	mg/kg dry wt.	20	USEPA-6020A	04/30/10 15:03	DSC	1003935

*See Statement of Data Qualifications

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB110-0002**	Sampled:	04/20/10 11:25
Lab Sample ID:	**1004372-05**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**91**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB110-0305**	Sampled:	04/20/10 11:40
Lab Sample ID:	**1004372-06**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.9**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:43	DSC	1003935
Barium	**59**	0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:31	DSC	1003935
Cadmium	**2.5**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:43	DSC	1003935
Chromium	**14**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:43	DSC	1003935
Copper	**79**	0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:31	DSC	1003935
Lead	**160**	0.50	0.27	mg/kg dry wt.	5	USEPA-6020A	04/30/10 15:28	DSC	1003935
Mercury	**0.49**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 14:55	DSC	1004021
Selenium	**0.54**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:43	DSC	1003935
Silver	**0.22**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:43	DSC	1003935
Zinc	**210**	5.0	2.3	mg/kg dry wt.	5	USEPA-6020A	04/30/10 15:28	DSC	1003935

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB110-0305**	Sampled:	04/20/10 11:40
Lab Sample ID:	**1004372-06**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB112-0002**	Sampled:	04/20/10 14:55
Lab Sample ID:	**1004372-07**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	89		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**19**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:46	DSC	1003935
Barium	**420**	2.0	0.41	mg/kg dry wt.	20	USEPA-6020A	04/30/10 15:33	DSC	1003935
Cadmium	**2.6**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:46	DSC	1003935
Chromium	**15**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:46	DSC	1003935
Copper	**620**	2.0	1.6	mg/kg dry wt.	20	USEPA-6020A	04/30/10 15:33	DSC	1003935
Lead	**970**	2.0	1.1	mg/kg dry wt.	20	USEPA-6020A	04/30/10 15:33	DSC	1003935
Mercury	**5.0**	0.46	0.15	mg/kg dry wt.	10	USEPA-7471A	04/30/10 18:41	DSC	1004021
Selenium	**0.60**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:46	DSC	1003935
Silver	**0.28**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:46	DSC	1003935
Zinc	**670**	20	9.3	mg/kg dry wt.	20	USEPA-6020A	04/30/10 15:33	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB112-0002**	Sampled:	04/20/10 14:55
Lab Sample ID:	**1004372-07**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**89**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB112-0305**	Sampled:	04/20/10 15:05
Lab Sample ID:	**1004372-08**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	84		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**7.6**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:49	DSC	1003935
Barium	**75**	0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:36	DSC	1003935
Cadmium	**0.22**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:49	DSC	1003935
Chromium	**19**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:49	DSC	1003935
Copper	**30**	0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:49	DSC	1003935
Lead	**94**	0.20	0.11	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:36	DSC	1003935
Mercury	**0.16**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:02	DSC	1004021
Selenium	**0.42**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:49	DSC	1003935
Silver	**0.096**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:49	DSC	1003935
Zinc	**77**	2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:36	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB112-0305**	Sampled:	04/20/10 15:05
Lab Sample ID:	**1004372-08**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**84**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB111-0002**	Sampled:	04/20/10 15:30
Lab Sample ID:	**1004372-09**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	91		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**7.6**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:52	DSC	1003935
Barium	**110**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:38	DSC	1003935
Cadmium	**0.86**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:52	DSC	1003935
Chromium	**13**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:52	DSC	1003935
Copper	**190**	1.0	0.78	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:38	DSC	1003935
Lead	**370**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:38	DSC	1003935
Mercury	**0.36**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:07	DSC	1004021
Selenium	**0.50**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:52	DSC	1003935
Silver	**0.20**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:52	DSC	1003935
Zinc	**450**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:38	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB111-0002**	Sampled:	04/20/10 15:30
Lab Sample ID:	**1004372-09**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**91**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASBFD-01**	Sampled:	04/20/10 00:00
Lab Sample ID:	**1004372-10**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	91		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.2**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:55	DSC	1003935
Barium	**140**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:41	DSC	1003935
Cadmium	**0.79**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:55	DSC	1003935
Chromium	**12**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:55	DSC	1003935
Copper	**220**	1.0	0.78	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:41	DSC	1003935
Lead	**310**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:41	DSC	1003935
Mercury	**0.41**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:12	DSC	1004021
Selenium	**0.55**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:55	DSC	1003935
Silver	**0.17**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:55	DSC	1003935
Zinc	**270**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:41	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASBFD-01**	Sampled:	04/20/10 00:00
Lab Sample ID:	**1004372-10**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**91**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB111-0305**	Sampled:	04/20/10 15:40
Lab Sample ID:	**1004372-11**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	89		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**4.7**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Barium	**61**		0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:43	DSC	1003935
Cadmium	**0.14**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Chromium	**17**		0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Copper	**14**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Lead	**11**		0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Mercury	**0.035**	J	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:17	DSC	1004021
Selenium	**0.14**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Silver	**0.085**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935
Zinc	**41**		1.0	0.46	mg/kg dry wt.	1	USEPA-6020A	04/30/10 12:59	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB111-0305**	Sampled:	04/20/10 15:40
Lab Sample ID:	**1004372-11**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**89**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASBFD-02**	Sampled:	04/20/10 00:00
Lab Sample ID:	**1004372-12**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	91		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.8**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:02	DSC	1003935
Barium	**110**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:46	DSC	1003935
Cadmium	**0.52**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:02	DSC	1003935
Chromium	**16**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:02	DSC	1003935
Copper	**110**	1.0	0.78	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:46	DSC	1003935
Lead	**300**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:46	DSC	1003935
Mercury	**0.35**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:41	DSC	1004021
Selenium	**0.74**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:02	DSC	1003935
Silver	**0.10**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:02	DSC	1003935
Zinc	**180**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:46	DSC	1003935

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASBFD-02**	Sampled:	04/20/10 00:00
Lab Sample ID:	**1004372-12**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**91**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASBFD-03**	Sampled:	04/20/10 00:00
Lab Sample ID:	**1004372-13**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	90		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.9**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:05	DSC	1003935
Barium	**130**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:57	DSC	1003935
Cadmium	**0.45**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:05	DSC	1003935
Chromium	**14**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:05	DSC	1003935
Copper	**67**	0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 15:59	DSC	1003935
Lead	**350**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:57	DSC	1003935
Mercury	**0.32**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:46	DSC	1004021
Selenium	**0.57**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:05	DSC	1003935
Silver	**0.11**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:05	DSC	1003935
Zinc	**190**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 15:57	DSC	1003935

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASBFD-03**	Sampled:	04/20/10 00:00
Lab Sample ID:	**1004372-13**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**90**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB115-0002**	Sampled:	04/20/10 16:00
Lab Sample ID:	**1004372-14**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	92		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.4**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:08	DSC	1003935
Barium	**100**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:02	DSC	1003935
Cadmium	**0.42**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:08	DSC	1003935
Chromium	**14**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:08	DSC	1003935
Copper	**85**	0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:04	DSC	1003935
Lead	**280**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:02	DSC	1003935
Mercury	**0.37**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:51	DSC	1004021
Selenium	**0.74**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:08	DSC	1003935
Silver	**0.095**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:08	DSC	1003935
Zinc	**140**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:02	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB115-0002**	Sampled:	04/20/10 16:00
Lab Sample ID:	**1004372-14**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**92**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB115-0305**	Sampled:	04/20/10 16:10
Lab Sample ID:	**1004372-15**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**5.5**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:21	DSC	1003935
Barium	**95**	0.50	0.10	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:07	DSC	1003935
Cadmium	**0.25**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:21	DSC	1003935
Chromium	**16**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:21	DSC	1003935
Copper	**26**	0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:21	DSC	1003935
Lead	**140**	0.50	0.27	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:07	DSC	1003935
Mercury	**0.53**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 15:56	DSC	1004021
Selenium	**0.45**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:21	DSC	1003935
Silver	**0.13**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:21	DSC	1003935
Zinc	**110**	5.0	2.3	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:07	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB115-0305**	Sampled:	04/20/10 16:10
Lab Sample ID:	**1004372-15**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB109-0002**	Sampled:	04/20/10 16:25
Lab Sample ID:	**1004372-16**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	92		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**9.2**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:24	DSC	1003935
Barium	**150**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:09	DSC	1003935
Cadmium	**0.45**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:24	DSC	1003935
Chromium	**12**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:24	DSC	1003935
Copper	**71**	0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:12	DSC	1003935
Lead	**450**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:09	DSC	1003935
Mercury	**0.41**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 16:01	DSC	1004021
Selenium	**0.59**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:24	DSC	1003935
Silver	**0.13**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:24	DSC	1003935
Zinc	**200**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:09	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB109-0002**	Sampled:	04/20/10 16:25
Lab Sample ID:	**1004372-16**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**92**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB109-0305**	Sampled:	04/20/10 16:35
Lab Sample ID:	**1004372-17**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	79		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**11**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:27	DSC	1003935
Barium	**110**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:17	DSC	1003935
Cadmium	**0.65**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:27	DSC	1003935
Chromium	**10**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:27	DSC	1003935
Copper	**180**	1.0	0.78	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:17	DSC	1003935
Lead	**2400**	10	5.4	mg/kg dry wt.	100	USEPA-6020A	04/30/10 17:34	DSC	1003935
Mercury	**1.4**	0.25	0.082	mg/kg dry wt.	5	USEPA-7471A	04/30/10 18:47	DSC	1004021
Selenium	**2.6**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:27	DSC	1003935
Silver	**0.19**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:27	DSC	1003935
Zinc	**260**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:17	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB109-0305**	Sampled:	04/20/10 16:35
Lab Sample ID:	**1004372-17**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**79**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB104-0002**	Sampled:	04/20/10 16:45
Lab Sample ID:	**1004372-18**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	85		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**11**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:30	DSC	1003935
Barium	**110**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:26	DSC	1003935
Cadmium	**0.79**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:30	DSC	1003935
Chromium	**18**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:30	DSC	1003935
Copper	**79**	0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:28	DSC	1003935
Lead	**360**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:26	DSC	1003935
Mercury	**0.41**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 16:12	DSC	1004021
Selenium	**0.50**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:30	DSC	1003935
Silver	**0.15**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:30	DSC	1003935
Zinc	**270**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:26	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB104-0002**	Sampled:	04/20/10 16:45
Lab Sample ID:	**1004372-18**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**85**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB104-0305**	Sampled:	04/20/10 16:55
Lab Sample ID:	**1004372-19**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	86		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.4**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Barium	**47**	0.10	0.021	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Cadmium	**0.17**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Chromium	**16**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Copper	**14**	0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Lead	**16**	0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Mercury	**0.065**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 16:17	DSC	1004021
Selenium	**0.25**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Silver	**0.076**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:34	DSC	1003935
Zinc	**56**	2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:31	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB104-0305**	Sampled:	04/20/10 16:55
Lab Sample ID:	**1004372-19**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**86**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB114-0002**	Sampled:	04/21/10 09:10
Lab Sample ID:	**1004372-20**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/28/10 By: BJH
Dilution Factor:	20	Analyzed:	05/08/10 By: DMC
QC Batch:	1003979	Analytical Batch:	0E10053
Percent Solids:	93		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.36U	0.36	0.033
208-96-8	Acenaphthylene	0.36U	0.36	0.024
120-12-7	Anthracene	**0.092J**	0.36	0.025
56-55-3	Benzo(a)anthracene	**0.60**	0.36	0.14
50-32-8	Benzo(a)pyrene	**0.56**	0.36	0.027
205-99-2	Benzo(b)fluoranthene	**0.80**	0.36	0.029
207-08-9	Benzo(k)fluoranthene	**0.73**	0.36	0.026
191-24-2	Benzo(g,h,i)perylene	**0.51**	0.36	0.027
218-01-9	Chrysene	**0.92**	0.36	0.15
53-70-3	Dibenz(a,h)anthracene	0.36U	0.36	0.035
206-44-0	Fluoranthene	**0.86**	0.36	0.027
86-73-7	Fluorene	0.36U	0.36	0.027
193-39-5	Indeno(1,2,3-cd)pyrene	**0.37**	0.36	0.022
91-57-6	2-Methylnaphthalene	0.36U	0.36	0.033
91-20-3	Naphthalene	**0.034J**	0.36	0.017
85-01-8	Phenanthrene	**0.36**	0.36	0.026
129-00-0	Pyrene	**0.80**	0.36	0.17

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB114-0002**	Sampled:	04/21/10 09:10
Lab Sample ID:	**1004372-20**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	93		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**7.3**	0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:37	DSC	1003935
Barium	**140**	1.0	0.21	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:33	DSC	1003935
Cadmium	**0.71**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:37	DSC	1003935
Chromium	**20**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:37	DSC	1003935
Copper	**77**	0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:36	DSC	1003935
Lead	**410**	1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:33	DSC	1003935
Mercury	**0.41**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 16:22	DSC	1004021
Selenium	**0.50**	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:37	DSC	1003935
Silver	**0.12**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:37	DSC	1003935
Zinc	**210**	10	4.6	mg/kg dry wt.	10	USEPA-6020A	04/30/10 16:33	DSC	1003935

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB114-0002**	Sampled:	04/21/10 09:10
Lab Sample ID:	**1004372-20**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**93**	0.1	0.1	%	1	USEPA-3550B	04/29/10 12:00	CLB	1004045

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB114-0305**	Sampled:	04/21/10 09:15
Lab Sample ID:	**1004372-21**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	5	Analyzed:	05/08/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10053
Percent Solids:	83		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.018J**	0.10	0.0094
208-96-8	Acenaphthylene	**0.011J**	0.10	0.0066
120-12-7	Anthracene	**0.077J**	0.10	0.0069
56-55-3	Benzo(a)anthracene	**0.25**	0.10	0.038
50-32-8	Benzo(a)pyrene	**0.28**	0.10	0.0076
205-99-2	Benzo(b)fluoranthene	**0.34**	0.10	0.0080
207-08-9	Benzo(k)fluoranthene	**0.084J**	0.10	0.0073
191-24-2	Benzo(g,h,i)perylene	**0.20**	0.10	0.0075
218-01-9	Chrysene	**0.28**	0.10	0.041
53-70-3	Dibenz(a,h)anthracene	0.10U	0.10	0.0097
206-44-0	Fluoranthene	**0.42**	0.10	0.0076
86-73-7	Fluorene	**0.022J**	0.10	0.0075
193-39-5	Indeno(1,2,3-cd)pyrene	**0.18**	0.10	0.0060
91-57-6	2-Methylnaphthalene	**0.069J**	0.10	0.0091
91-20-3	Naphthalene	**0.045J**	0.10	0.0049
85-01-8	Phenanthrene	**0.27**	0.10	0.0074
129-00-0	Pyrene	**0.45**	0.10	0.047

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	90	*33-131*
2-Fluorobiphenyl	99	*46-122*
o-Terphenyl	97	*20-155*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB114-0305**	Sampled:	04/21/10 09:15
Lab Sample ID:	**1004372-21**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	83		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**17**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:47	DSC	1003996
Barium	**150**		0.50	0.10	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:41	DSC	1003996
Cadmium	**0.47**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:47	DSC	1003996
***Chromium**	**16**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:47	DSC	1003996
Copper	**65**		0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:43	DSC	1003996
Lead	**760**		2.0	1.1	mg/kg dry wt.	20	USEPA-6020A	04/30/10 16:38	DSC	1003996
Mercury	**0.69**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:07	DSC	1004025
Selenium	**1.9**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:47	DSC	1003996
Silver	**0.18**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:47	DSC	1003996
Zinc	**230**		5.0	2.3	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:41	DSC	1003996

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB114-0305**	Sampled:	04/21/10 09:15
Lab Sample ID:	**1004372-21**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**83**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB107-0002**	Sampled:	04/21/10 09:45
Lab Sample ID:	**1004372-22**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	5	Analyzed:	05/08/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10053
Percent Solids:	89		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.020J**	0.093	0.0087
208-96-8	Acenaphthylene	**0.022J**	0.093	0.0062
120-12-7	Anthracene	**0.082J**	0.093	0.0064
56-55-3	Benzo(a)anthracene	**0.30**	0.093	0.036
*50-32-8	Benzo(a)pyrene	**0.23**	0.093	0.0070
*205-99-2	Benzo(b)fluoranthene	**0.36**	0.093	0.0074
*207-08-9	Benzo(k)fluoranthene	**0.057J**	0.093	0.0068
191-24-2	Benzo(g,h,i)perylene	**0.14**	0.093	0.0069
218-01-9	Chrysene	**0.27**	0.093	0.038
53-70-3	Dibenz(a,h)anthracene	**0.021J**	0.093	0.0090
206-44-0	Fluoranthene	**0.50**	0.093	0.0070
86-73-7	Fluorene	**0.026J**	0.093	0.0069
193-39-5	Indeno(1,2,3-cd)pyrene	**0.17**	0.093	0.0056
91-57-6	2-Methylnaphthalene	**0.015J**	0.093	0.0085
91-20-3	Naphthalene	**0.010J**	0.093	0.0045
85-01-8	Phenanthrene	**0.31**	0.093	0.0069
129-00-0	Pyrene	**0.53**	0.093	0.043

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	81	*33-131*
2-Fluorobiphenyl	91	*46-122*
o-Terphenyl	105	*20-155*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB107-0002**	Sampled:	04/21/10 09:45
Lab Sample ID:	**1004372-22**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	89		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.7**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:50	DSC	1003996
Barium	**65**		0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 16:59	DSC	1003996
Cadmium	**0.57**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:50	DSC	1003996
***Chromium**	**16**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:50	DSC	1003996
***Copper**	**130**		0.50	0.39	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:46	DSC	1003996
***Lead**	**190**		1.0	0.54	mg/kg dry wt.	10	USEPA-6020A	05/03/10 10:18	DSC	1003996
Mercury	**0.11**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:12	DSC	1004025
Selenium	**0.32**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:50	DSC	1003996
***Silver**	**0.078**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 13:50	DSC	1003996
***Zinc**	**130**		5.0	2.3	mg/kg dry wt.	5	USEPA-6020A	04/30/10 16:46	DSC	1003996

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB107-0002**	Sampled:	04/21/10 09:45
Lab Sample ID:	**1004372-22**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**89**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB107-0204**	Sampled:	04/21/10 09:50
Lab Sample ID:	**1004372-23**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	5	Analyzed:	05/09/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10053
Percent Solids:	90		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.44**	0.093	0.0086
208-96-8	Acenaphthylene	**0.11**	0.093	0.0061
120-12-7	Anthracene	**0.84**	0.093	0.0064
56-55-3	Benzo(a)anthracene	**2.6**	0.093	0.035
50-32-8	Benzo(a)pyrene	**1.6**	0.093	0.0069
205-99-2	Benzo(b)fluoranthene	**1.9**	0.093	0.0074
207-08-9	Benzo(k)fluoranthene	**1.2**	0.093	0.0067
191-24-2	Benzo(g,h,i)perylene	**0.83**	0.093	0.0069
218-01-9	Chrysene	**2.8**	0.093	0.038
53-70-3	Dibenz(a,h)anthracene	**0.29**	0.093	0.0089
206-44-0	Fluoranthene	**4.3**	0.093	0.0069
86-73-7	Fluorene	**0.43**	0.093	0.0069
193-39-5	Indeno(1,2,3-cd)pyrene	**0.73**	0.093	0.0056
91-57-6	2-Methylnaphthalene	**0.22**	0.093	0.0084
91-20-3	Naphthalene	**0.22**	0.093	0.0045
85-01-8	Phenanthrene	**2.8**	0.093	0.0068
129-00-0	Pyrene	**3.3**	0.093	0.043

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	88	*33-131*
2-Fluorobiphenyl	97	*46-122*
o-Terphenyl	101	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB107-0204**	Sampled:	04/21/10 09:50
Lab Sample ID:	**1004372-23**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	90		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**9.4**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:15	DSC	1003996
Barium	**74**		0.50	0.10	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:12	DSC	1003996
Cadmium	**0.46**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:15	DSC	1003996
***Chromium**	**13**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:15	DSC	1003996
Copper	**98**		0.50	0.39	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:12	DSC	1003996
Lead	**130**		0.50	0.27	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:12	DSC	1003996
Mercury	**0.27**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:27	DSC	1004025
Selenium	**0.36**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:15	DSC	1003996
Silver	**0.14**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:15	DSC	1003996
Zinc	**160**		5.0	2.3	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:12	DSC	1003996

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB107-0204**	Sampled:	04/21/10 09:50
Lab Sample ID:	**1004372-23**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**90**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB105-0002**	Sampled:	04/21/10 10:10
Lab Sample ID:	**1004372-24**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	50	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	88		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.98**	0.95	0.088
208-96-8	Acenaphthylene	**0.73J**	0.95	0.063
120-12-7	Anthracene	**2.1**	0.95	0.065
56-55-3	Benzo(a)anthracene	**3.7**	0.95	0.36
50-32-8	Benzo(a)pyrene	**2.9**	0.95	0.071
205-99-2	Benzo(b)fluoranthene	**3.2**	0.95	0.076
207-08-9	Benzo(k)fluoranthene	**2.3**	0.95	0.069
191-24-2	Benzo(g,h,i)perylene	**1.5**	0.95	0.071
218-01-9	Chrysene	**3.8**	0.95	0.39
53-70-3	Dibenz(a,h)anthracene	0.95U	0.95	0.092
206-44-0	Fluoranthene	**8.4**	0.95	0.071
86-73-7	Fluorene	**2.2**	0.95	0.071
193-39-5	Indeno(1,2,3-cd)pyrene	**1.2**	0.95	0.057
91-57-6	2-Methylnaphthalene	**4.3**	0.95	0.086
91-20-3	Naphthalene	**3.0**	0.95	0.046
85-01-8	Phenanthrene	**13**	0.95	0.070
129-00-0	Pyrene	**8.2**	0.95	0.44

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB105-0002**	Sampled:	04/21/10 10:10
Lab Sample ID:	**1004372-24**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	88		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.6**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:18	DSC	1003996
Barium	**74**		0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:15	DSC	1003996
Cadmium	**0.30**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:18	DSC	1003996
***Chromium**	**17**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:18	DSC	1003996
Copper	**29**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:18	DSC	1003996
Lead	**85**		0.20	0.11	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:15	DSC	1003996
Mercury	**0.24**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:33	DSC	1004025
Selenium	**0.18**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:18	DSC	1003996
Silver	**0.10**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:18	DSC	1003996
Zinc	**87**		2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:15	DSC	1003996

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB105-0002**	Sampled:	04/21/10 10:10
Lab Sample ID:	**1004372-24**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**88**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB105-0305**	Sampled:	04/21/10 10:15
Lab Sample ID:	**1004372-25**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	5	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	85		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.019J**	0.098	0.0091
208-96-8	Acenaphthylene	**0.0074J**	0.098	0.0065
120-12-7	Anthracene	**0.076J**	0.098	0.0068
56-55-3	Benzo(a)anthracene	**0.22**	0.098	0.037
50-32-8	Benzo(a)pyrene	**0.20**	0.098	0.0073
205-99-2	Benzo(b)fluoranthene	**0.25**	0.098	0.0078
207-08-9	Benzo(k)fluoranthene	**0.096J**	0.098	0.0071
191-24-2	Benzo(g,h,i)perylene	**0.11**	0.098	0.0073
218-01-9	Chrysene	**0.21**	0.098	0.040
53-70-3	Dibenz(a,h)anthracene	**0.037J**	0.098	0.0095
206-44-0	Fluoranthene	**0.42**	0.098	0.0073
86-73-7	Fluorene	**0.037J**	0.098	0.0073
193-39-5	Indeno(1,2,3-cd)pyrene	**0.11**	0.098	0.0059
91-57-6	2-Methylnaphthalene	**0.027J**	0.098	0.0089
91-20-3	Naphthalene	**0.027J**	0.098	0.0047
85-01-8	Phenanthrene	**0.43**	0.098	0.0072
129-00-0	Pyrene	**0.43**	0.098	0.046

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	87	*33-131*
2-Fluorobiphenyl	98	*46-122*
o-Terphenyl	98	*20-155*

*See Statement of Data Qualifications

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB105-0305**	Sampled:	04/21/10 10:15
Lab Sample ID:	**1004372-25**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	85		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**8.8**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:21	DSC	1003996
Barium	**66**		0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:17	DSC	1003996
Cadmium	**0.24**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:21	DSC	1003996
***Chromium**	**14**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:21	DSC	1003996
Copper	**60**		0.20	0.16	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:17	DSC	1003996
Lead	**93**		0.20	0.11	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:17	DSC	1003996
Mercury	**0.16**		0.047	0.015	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:38	DSC	1004025
Selenium	**0.34**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:21	DSC	1003996
Silver	**0.12**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:21	DSC	1003996
Zinc	**79**		2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:17	DSC	1003996

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB105-0305**	Sampled:	04/21/10 10:15
Lab Sample ID:	**1004372-25**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**85**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB103-0002**	Sampled:	04/21/10 10:30
Lab Sample ID:	**1004372-26**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	1	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	92		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.0080J**	0.018	0.0017
208-96-8	Acenaphthylene	**0.0088J**	0.018	0.0012
120-12-7	Anthracene	**0.029**	0.018	0.0012
56-55-3	Benzo(a)anthracene	**0.16**	0.018	0.0069
50-32-8	Benzo(a)pyrene	**0.14**	0.018	0.0014
205-99-2	Benzo(b)fluoranthene	**0.21**	0.018	0.0014
207-08-9	Benzo(k)fluoranthene	**0.071**	0.018	0.0013
191-24-2	Benzo(g,h,i)perylene	**0.092**	0.018	0.0013
218-01-9	Chrysene	**0.17**	0.018	0.0074
53-70-3	Dibenz(a,h)anthracene	**0.031**	0.018	0.0017
206-44-0	Fluoranthene	**0.32**	0.018	0.0014
86-73-7	Fluorene	**0.011J**	0.018	0.0013
193-39-5	Indeno(1,2,3-cd)pyrene	**0.083**	0.018	0.0011
91-57-6	2-Methylnaphthalene	**0.0031J**	0.018	0.0016
91-20-3	Naphthalene	**0.0024J**	0.018	0.00087
85-01-8	Phenanthrene	**0.18**	0.018	0.0013
129-00-0	Pyrene	**0.28**	0.018	0.0084

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	131	*33-131*
2-Fluorobiphenyl	112	*46-122*
o-Terphenyl	126	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB103-0002**	Sampled:	04/21/10 10:30
Lab Sample ID:	**1004372-26**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	92		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.8**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Barium	**49**		0.10	0.021	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Cadmium	**0.18**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
***Chromium**	**13**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Copper	**14**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Lead	**43**		0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Mercury	**0.044**	**J**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:43	DSC	1004025
Selenium	**0.25**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Silver	**0.085**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996
Zinc	**45**		1.0	0.46	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:24	DSC	1003996

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB103-0002**	Sampled:	04/21/10 10:30
Lab Sample ID:	**1004372-26**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**92**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB103-0305**	Sampled:	04/21/10 10:35
Lab Sample ID:	**1004372-27**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	1	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	87		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.019U	0.019	0.0018
208-96-8	Acenaphthylene	0.019U	0.019	0.0013
120-12-7	Anthracene	**0.0058J**	0.019	0.0013
56-55-3	Benzo(a)anthracene	**0.011J**	0.019	0.0073
50-32-8	Benzo(a)pyrene	**0.017J**	0.019	0.0014
205-99-2	Benzo(b)fluoranthene	**0.019**	0.019	0.0015
207-08-9	Benzo(k)fluoranthene	**0.0080J**	0.019	0.0014
191-24-2	Benzo(g,h,i)perylene	**0.013J**	0.019	0.0014
218-01-9	Chrysene	**0.013J**	0.019	0.0079
53-70-3	Dibenz(a,h)anthracene	0.019U	0.019	0.0019
206-44-0	Fluoranthene	**0.024**	0.019	0.0014
86-73-7	Fluorene	**0.0019J**	0.019	0.0014
193-39-5	Indeno(1,2,3-cd)pyrene	**0.0088J**	0.019	0.0012
91-57-6	2-Methylnaphthalene	0.019U	0.019	0.0017
91-20-3	Naphthalene	**0.0016J**	0.019	0.00093
85-01-8	Phenanthrene	**0.018J**	0.019	0.0014
129-00-0	Pyrene	**0.024**	0.019	0.0089

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	89	*33-131*
2-Fluorobiphenyl	87	*46-122*
o-Terphenyl	96	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB103-0305**	Sampled:	04/21/10 10:35
Lab Sample ID:	**1004372-27**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**5.0**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Barium	**36**		0.10	0.021	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Cadmium	**0.19**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
***Chromium**	**13**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Copper	**13**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Lead	**12**		0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Mercury	**0.031**	**J**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 17:48	DSC	1004025
Selenium	**0.36**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Silver	**0.074**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996
Zinc	**39**		1.0	0.46	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:27	DSC	1003996

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB103-0305**	Sampled:	04/21/10 10:35
Lab Sample ID:	**1004372-27**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB108-0002**	Sampled:	04/21/10 10:45
Lab Sample ID:	**1004372-28**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	2	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	93		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.036U	0.036	0.0033
208-96-8	Acenaphthylene	**0.0033J**	0.036	0.0024
120-12-7	Anthracene	**0.013J**	0.036	0.0025
56-55-3	Benzo(a)anthracene	**0.057**	0.036	0.014
50-32-8	Benzo(a)pyrene	**0.067**	0.036	0.0027
205-99-2	Benzo(b)fluoranthene	**0.065**	0.036	0.0029
207-08-9	Benzo(k)fluoranthene	**0.045**	0.036	0.0026
191-24-2	Benzo(g,h,i)perylene	**0.044**	0.036	0.0027
218-01-9	Chrysene	**0.053**	0.036	0.015
53-70-3	Dibenz(a,h)anthracene	0.036U	0.036	0.0035
206-44-0	Fluoranthene	**0.081**	0.036	0.0027
86-73-7	Fluorene	**0.0038J**	0.036	0.0027
193-39-5	Indeno(1,2,3-cd)pyrene	**0.036**	0.036	0.0022
91-57-6	2-Methylnaphthalene	0.036U	0.036	0.0033
91-20-3	Naphthalene	0.036U	0.036	0.0017
85-01-8	Phenanthrene	**0.051**	0.036	0.0027
129-00-0	Pyrene	**0.076**	0.036	0.017

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	79	*33-131*
2-Fluorobiphenyl	83	*46-122*
o-Terphenyl	94	*20-155*

*See Statement of Data Qualifications

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB108-0002**	Sampled:	04/21/10 10:45
Lab Sample ID:	**1004372-28**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	93		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**2.5**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Barium	**26**		0.10	0.021	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Cadmium	**0.16**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
***Chromium**	**10**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Copper	**8.7**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Lead	**11**		0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Mercury	**0.018**	**J**	0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 18:04	DSC	1004025
Selenium	0.10	U	0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Silver	**0.045**	**J**	0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996
Zinc	**31**		1.0	0.46	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:31	DSC	1003996

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB108-0002**	Sampled:	04/21/10 10:45
Lab Sample ID:	**1004372-28**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**93**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB108-0305**	Sampled:	04/21/10 10:55
Lab Sample ID:	**1004372-29**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	1	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	83		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.020U	0.020	0.0019
208-96-8	Acenaphthylene	0.020U	0.020	0.0013
120-12-7	Anthracene	**0.0044J**	0.020	0.0014
56-55-3	Benzo(a)anthracene	**0.013J**	0.020	0.0076
50-32-8	Benzo(a)pyrene	**0.013J**	0.020	0.0015
205-99-2	Benzo(b)fluoranthene	**0.023**	0.020	0.0016
207-08-9	Benzo(k)fluoranthene	**0.0065J**	0.020	0.0015
191-24-2	Benzo(g,h,i)perylene	**0.010J**	0.020	0.0015
218-01-9	Chrysene	**0.013J**	0.020	0.0082
53-70-3	Dibenz(a,h)anthracene	0.020U	0.020	0.0019
206-44-0	Fluoranthene	**0.024**	0.020	0.0015
86-73-7	Fluorene	0.020U	0.020	0.0015
193-39-5	Indeno(1,2,3-cd)pyrene	**0.0087J**	0.020	0.0012
91-57-6	2-Methylnaphthalene	0.020U	0.020	0.0018
91-20-3	Naphthalene	0.020U	0.020	0.00097
85-01-8	Phenanthrene	**0.012J**	0.020	0.0015
129-00-0	Pyrene	**0.024**	0.020	0.0093

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	91	*33-131*
2-Fluorobiphenyl	87	*46-122*
o-Terphenyl	87	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB108-0305**	Sampled:	04/21/10 10:55
Lab Sample ID:	**1004372-29**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	83		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**3.3**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996
Barium	**73**		0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:20	DSC	1003996
Cadmium	**0.15**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996
***Chromium**	**12**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996
Copper	**12**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996
Lead	**53**		0.20	0.11	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:20	DSC	1003996
Mercury	**0.28**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 18:10	DSC	1004025
Selenium	**0.17**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996
Silver	**0.064**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996
Zinc	**46**		1.0	0.46	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:41	DSC	1003996

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB108-0305**	Sampled:	04/21/10 10:55
Lab Sample ID:	**1004372-29**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**83**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB101-0002**	Sampled:	04/21/10 11:05
Lab Sample ID:	**1004372-32**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	1	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	88		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.013J**	0.019	0.0018
208-96-8	Acenaphthylene	**0.0071J**	0.019	0.0013
120-12-7	Anthracene	**0.059**	0.019	0.0013
56-55-3	Benzo(a)anthracene	**0.18**	0.019	0.0073
50-32-8	Benzo(a)pyrene	**0.15**	0.019	0.0014
205-99-2	Benzo(b)fluoranthene	**0.20**	0.019	0.0015
207-08-9	Benzo(k)fluoranthene	**0.069**	0.019	0.0014
191-24-2	Benzo(g,h,i)perylene	**0.11**	0.019	0.0014
218-01-9	Chrysene	**0.17**	0.019	0.0078
53-70-3	Dibenz(a,h)anthracene	**0.026**	0.019	0.0018
206-44-0	Fluoranthene	**0.37**	0.019	0.0014
86-73-7	Fluorene	**0.018J**	0.019	0.0014
193-39-5	Indeno(1,2,3-cd)pyrene	**0.098**	0.019	0.0011
91-57-6	2-Methylnaphthalene	**0.0045J**	0.019	0.0017
91-20-3	Naphthalene	**0.0058J**	0.019	0.00092
85-01-8	Phenanthrene	**0.21**	0.019	0.0014
129-00-0	Pyrene	**0.30**	0.019	0.0088

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	101	*33-131*
2-Fluorobiphenyl	82	*46-122*
o-Terphenyl	99	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB101-0002**	Sampled:	04/21/10 11:05
Lab Sample ID:	**1004372-32**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	88		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**5.7**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
Barium	**59**		0.20	0.041	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:29	DSC	1003996
Cadmium	**0.28**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
***Chromium**	**15**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
Copper	**16**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
Lead	**31**		0.10	0.054	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
Mercury	**0.062**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 18:15	DSC	1004025
Selenium	**0.28**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
Silver	**0.079**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:44	DSC	1003996
Zinc	**62**		2.0	0.93	mg/kg dry wt.	2	USEPA-6020A	04/30/10 17:29	DSC	1003996

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB101-0002**	Sampled:	04/21/10 11:05
Lab Sample ID:	**1004372-32**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**88**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB101-0305**	Sampled:	04/21/10 11:10
Lab Sample ID:	**1004372-33**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Unit:	mg/kg dry	Prepared:	04/29/10 By: BJH
Dilution Factor:	1	Analyzed:	05/10/10 By: DMC
QC Batch:	1003982	Analytical Batch:	0E10074
Percent Solids:	87		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.023**	0.019	0.0018
208-96-8	Acenaphthylene	**0.017J**	0.019	0.0013
120-12-7	Anthracene	**0.11**	0.019	0.0013
56-55-3	Benzo(a)anthracene	**0.49**	0.019	0.0074
50-32-8	Benzo(a)pyrene	**0.31**	0.019	0.0014
205-99-2	Benzo(b)fluoranthene	**0.28**	0.019	0.0015
207-08-9	Benzo(k)fluoranthene	**0.23**	0.019	0.0014
191-24-2	Benzo(g,h,i)perylene	**0.15**	0.019	0.0014
218-01-9	Chrysene	**0.43**	0.019	0.0079
53-70-3	Dibenz(a,h)anthracene	**0.056**	0.019	0.0019
206-44-0	Fluoranthene	**0.86**	0.019	0.0014
86-73-7	Fluorene	**0.024**	0.019	0.0014
193-39-5	Indeno(1,2,3-cd)pyrene	**0.15**	0.019	0.0012
91-57-6	2-Methylnaphthalene	**0.0070J**	0.019	0.0017
91-20-3	Naphthalene	**0.0085J**	0.019	0.00093
85-01-8	Phenanthrene	**0.37**	0.019	0.0014
129-00-0	Pyrene	**0.72**	0.019	0.0090

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	95	*33-131*
2-Fluorobiphenyl	89	*46-122*
o-Terphenyl	100	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB101-0305**	Sampled:	04/21/10 11:10
Lab Sample ID:	**1004372-33**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**7.6**		0.10	0.039	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:48	DSC	1003996
Barium	**90**		0.50	0.10	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:31	DSC	1003996
Cadmium	**0.23**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:48	DSC	1003996
***Chromium**	**18**	**B**	0.10	0.057	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:48	DSC	1003996
Copper	**23**		0.10	0.078	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:48	DSC	1003996
Lead	**180**		0.50	0.27	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:31	DSC	1003996
Mercury	**0.30**		0.050	0.016	mg/kg dry wt.	1	USEPA-7471A	04/30/10 18:20	DSC	1004025
Selenium	**0.37**		0.10	0.088	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:48	DSC	1003996
Silver	**0.13**		0.050	0.011	mg/kg dry wt.	1	USEPA-6020A	04/30/10 14:48	DSC	1003996
Zinc	**93**		5.0	2.3	mg/kg dry wt.	5	USEPA-6020A	04/30/10 17:31	DSC	1003996

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DASB101-0305**	Sampled:	04/21/10 11:10
Lab Sample ID:	**1004372-33**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/21/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	04/29/10 15:00	CLB	1004052

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-102-0002**	Sampled:	05/25/11 09:20
Lab Sample ID:	**1105435-02**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	87		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.12J**	0.19	0.038
208-96-8	Acenaphthylene	0.19U	0.19	0.038
*120-12-7	Anthracene	**0.25**	0.19	0.012
*56-55-3	Benzo(a)anthracene	**0.54**	0.19	0.038
*50-32-8	Benzo(a)pyrene	**0.40**	0.19	0.038
*205-99-2	Benzo(b)fluoranthene	**0.58**	0.19	0.023
207-08-9	Benzo(k)fluoranthene	**0.18J**	0.19	0.021
191-24-2	Benzo(g,h,i)perylene	**0.22**	0.19	0.022
*218-01-9	Chrysene	**0.58**	0.19	0.014
53-70-3	Dibenz(a,h)anthracene	0.19U	0.19	0.19
*206-44-0	Fluoranthene	**1.0**	0.19	0.038
*86-73-7	Fluorene	**0.22**	0.19	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.19**	0.19	0.023
*91-57-6	2-Methylnaphthalene	**0.27**	0.19	0.0098
91-20-3	Naphthalene	**0.20**	0.19	0.011
*85-01-8	Phenanthrene	**1.2**	0.19	0.038
*129-00-0	Pyrene	**0.97**	0.19	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	64	*33-131*
2-Fluorobiphenyl	68	*46-122*
o-Terphenyl	75	*20-155*

*See Statement of Data Qualifications

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-102-0002**	Sampled:	05/25/11 09:20
Lab Sample ID:	**1105435-02**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.053**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 07:46	DSC	1105367

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-102-0002**	Sampled:	05/25/11 09:20
Lab Sample ID:	**1105435-02**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-102-0406**	Sampled:	05/25/11 09:25
Lab Sample ID:	**1105435-03**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	88		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.38**	0.19	0.038
208-96-8	Acenaphthylene	**0.13J**	0.19	0.038
120-12-7	Anthracene	**0.45**	0.19	0.012
56-55-3	Benzo(a)anthracene	**0.99**	0.19	0.038
50-32-8	Benzo(a)pyrene	**0.66**	0.19	0.038
205-99-2	Benzo(b)fluoranthene	**0.86**	0.19	0.022
207-08-9	Benzo(k)fluoranthene	**0.40**	0.19	0.020
191-24-2	Benzo(g,h,i)perylene	**0.30**	0.19	0.021
218-01-9	Chrysene	**0.89**	0.19	0.014
53-70-3	Dibenz(a,h)anthracene	0.19U	0.19	0.19
206-44-0	Fluoranthene	**1.7**	0.19	0.038
86-73-7	Fluorene	**0.92**	0.19	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.27**	0.19	0.022
91-57-6	2-Methylnaphthalene	**1.8**	0.19	0.0097
91-20-3	Naphthalene	**1.7**	0.19	0.010
85-01-8	Phenanthrene	**3.2**	0.19	0.038
129-00-0	Pyrene	**2.0**	0.19	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	68	*33-131*
2-Fluorobiphenyl	88	*46-122*
o-Terphenyl	89	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-102-0406**	Sampled:	05/25/11 09:25
Lab Sample ID:	**1105435-03**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	88		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.32**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:00	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-102-0406**	Sampled:	05/25/11 09:25
Lab Sample ID:	**1105435-03**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**88**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-FD-01**	Sampled:	05/25/11 00:00
Lab Sample ID:	**1105435-04**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	87		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.046J**	0.19	0.038
208-96-8	Acenaphthylene	0.19U	0.19	0.038
120-12-7	Anthracene	**0.10J**	0.19	0.012
56-55-3	Benzo(a)anthracene	**0.32**	0.19	0.038
50-32-8	Benzo(a)pyrene	**0.28**	0.19	0.038
205-99-2	Benzo(b)fluoranthene	**0.31**	0.19	0.022
207-08-9	Benzo(k)fluoranthene	**0.16J**	0.19	0.020
191-24-2	Benzo(g,h,i)perylene	**0.15J**	0.19	0.022
218-01-9	Chrysene	**0.29**	0.19	0.014
53-70-3	Dibenz(a,h)anthracene	0.19U	0.19	0.19
206-44-0	Fluoranthene	**0.60**	0.19	0.038
86-73-7	Fluorene	**0.046J**	0.19	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.15J**	0.19	0.022
91-57-6	2-Methylnaphthalene	**0.012J**	0.19	0.0098
91-20-3	Naphthalene	**0.027J**	0.19	0.010
85-01-8	Phenanthrene	**0.43**	0.19	0.038
129-00-0	Pyrene	**0.56**	0.19	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	73	*33-131*
2-Fluorobiphenyl	86	*46-122*
o-Terphenyl	94	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-FD-01**	Sampled:	05/25/11 00:00
Lab Sample ID:	**1105435-04**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.082**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:05	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-FD-01**	Sampled:	05/25/11 00:00
Lab Sample ID:	**1105435-04**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-FD-01**	Sampled:	05/25/11 00:00
Lab Sample ID:	**1105435-05**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	85		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.51**	0.20	0.039
208-96-8	Acenaphthylene	**0.18J**	0.20	0.039
120-12-7	Anthracene	**1.0**	0.20	0.012
56-55-3	Benzo(a)anthracene	**2.1**	0.20	0.039
50-32-8	Benzo(a)pyrene	**1.4**	0.20	0.039
205-99-2	Benzo(b)fluoranthene	**2.1**	0.20	0.023
207-08-9	Benzo(k)fluoranthene	**0.94**	0.20	0.021
191-24-2	Benzo(g,h,i)perylene	**0.63**	0.20	0.022
218-01-9	Chrysene	**2.0**	0.20	0.014
53-70-3	Dibenz(a,h)anthracene	**0.24**	0.20	0.20
206-44-0	Fluoranthene	**3.9**	0.20	0.039
86-73-7	Fluorene	**1.3**	0.20	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.64**	0.20	0.023
91-57-6	2-Methylnaphthalene	**2.0**	0.20	0.010
91-20-3	Naphthalene	**1.5**	0.20	0.011
85-01-8	Phenanthrene	**6.1**	0.20	0.039
129-00-0	Pyrene	**3.9**	0.20	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	92	*33-131*
2-Fluorobiphenyl	91	*46-122*
o-Terphenyl	93	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-FD-01**	Sampled:	05/25/11 00:00
Lab Sample ID:	**1105435-05**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	85		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.29**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:10	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-FD-01**	Sampled:	05/25/11 00:00
Lab Sample ID:	**1105435-05**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**85**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-104-0002**	Sampled:	05/25/11 11:00
Lab Sample ID:	**1105435-06**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	88		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.049J**	0.19	0.038
208-96-8	Acenaphthylene	**0.049J**	0.19	0.038
120-12-7	Anthracene	**0.22**	0.19	0.012
56-55-3	Benzo(a)anthracene	**1.4**	0.19	0.038
50-32-8	Benzo(a)pyrene	**1.2**	0.19	0.038
205-99-2	Benzo(b)fluoranthene	**1.3**	0.19	0.022
207-08-9	Benzo(k)fluoranthene	**0.69**	0.19	0.020
191-24-2	Benzo(g,h,i)perylene	**0.51**	0.19	0.021
218-01-9	Chrysene	**1.1**	0.19	0.014
53-70-3	Dibenz(a,h)anthracene	0.19U	0.19	0.19
206-44-0	Fluoranthene	**1.9**	0.19	0.038
86-73-7	Fluorene	**0.046J**	0.19	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.55**	0.19	0.022
91-57-6	2-Methylnaphthalene	0.19U	0.19	0.0096
91-20-3	Naphthalene	**0.023J**	0.19	0.010
85-01-8	Phenanthrene	**0.68**	0.19	0.038
129-00-0	Pyrene	**2.1**	0.19	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	63	*33-131*
2-Fluorobiphenyl	68	*46-122*
o-Terphenyl	80	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-104-0002**	Sampled:	05/25/11 11:00
Lab Sample ID:	**1105435-06**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	88		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.19**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:15	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-104-0002**	Sampled:	05/25/11 11:00
Lab Sample ID:	**1105435-06**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**88**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-104-0204**	Sampled:	05/25/11 11:05
Lab Sample ID:	**1105435-07**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	85		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.12J**	0.20	0.039
208-96-8	Acenaphthylene	0.20U	0.20	0.039
120-12-7	Anthracene	**0.23**	0.20	0.012
56-55-3	Benzo(a)anthracene	**0.52**	0.20	0.039
50-32-8	Benzo(a)pyrene	**0.41**	0.20	0.039
205-99-2	Benzo(b)fluoranthene	**0.52**	0.20	0.023
207-08-9	Benzo(k)fluoranthene	**0.20**	0.20	0.021
191-24-2	Benzo(g,h,i)perylene	**0.19J**	0.20	0.022
218-01-9	Chrysene	**0.46**	0.20	0.014
53-70-3	Dibenz(a,h)anthracene	0.20U	0.20	0.20
206-44-0	Fluoranthene	**1.0**	0.20	0.039
86-73-7	Fluorene	**0.11J**	0.20	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.17J**	0.20	0.023
91-57-6	2-Methylnaphthalene	**0.028J**	0.20	0.010
91-20-3	Naphthalene	**0.028J**	0.20	0.011
85-01-8	Phenanthrene	**0.83**	0.20	0.039
129-00-0	Pyrene	**0.90**	0.20	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	68	*33-131*
2-Fluorobiphenyl	74	*46-122*
o-Terphenyl	92	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-104-0204**	Sampled:	05/25/11 11:05
Lab Sample ID:	**1105435-07**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	85		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.15**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:20	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-104-0204**	Sampled:	05/25/11 11:05
Lab Sample ID:	**1105435-07**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**85**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-106-0002**	Sampled:	05/25/11 13:10
Lab Sample ID:	**1105435-08**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	84		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.20U	0.20	0.040
208-96-8	Acenaphthylene	0.20U	0.20	0.040
120-12-7	Anthracene	**0.14J**	0.20	0.012
56-55-3	Benzo(a)anthracene	**0.40**	0.20	0.040
50-32-8	Benzo(a)pyrene	**0.29**	0.20	0.040
205-99-2	Benzo(b)fluoranthene	**0.39**	0.20	0.023
207-08-9	Benzo(k)fluoranthene	**0.14J**	0.20	0.021
191-24-2	Benzo(g,h,i)perylene	**0.12J**	0.20	0.022
218-01-9	Chrysene	**0.35**	0.20	0.015
53-70-3	Dibenz(a,h)anthracene	0.20U	0.20	0.20
206-44-0	Fluoranthene	**0.74**	0.20	0.040
86-73-7	Fluorene	0.20U	0.20	0.024
193-39-5	Indeno(1,2,3-cd)pyrene	**0.12J**	0.20	0.023
91-57-6	2-Methylnaphthalene	0.20U	0.20	0.010
91-20-3	Naphthalene	0.20U	0.20	0.011
85-01-8	Phenanthrene	**0.48**	0.20	0.040
129-00-0	Pyrene	**0.76**	0.20	0.013

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	55	*33-131*
2-Fluorobiphenyl	69	*46-122*
o-Terphenyl	74	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-106-0002**	Sampled:	05/25/11 13:10
Lab Sample ID:	**1105435-08**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	84		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.043**	J	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:44	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-106-0002**	Sampled:	05/25/11 13:10
Lab Sample ID:	**1105435-08**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**84**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-106-0204**	Sampled:	05/25/11 13:15
Lab Sample ID:	**1105435-09**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	86		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.29**	0.20	0.039
208-96-8	Acenaphthylene	**0.096J**	0.20	0.039
120-12-7	Anthracene	**0.58**	0.20	0.012
56-55-3	Benzo(a)anthracene	**3.0**	0.20	0.039
50-32-8	Benzo(a)pyrene	**2.2**	0.20	0.039
205-99-2	Benzo(b)fluoranthene	**3.0**	0.20	0.023
207-08-9	Benzo(k)fluoranthene	**1.2**	0.20	0.021
191-24-2	Benzo(g,h,i)perylene	**0.78**	0.20	0.022
218-01-9	Chrysene	**2.8**	0.20	0.014
53-70-3	Dibenz(a,h)anthracene	**0.40**	0.20	0.20
206-44-0	Fluoranthene	**4.3**	0.20	0.039
86-73-7	Fluorene	**0.33**	0.20	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.92**	0.20	0.023
91-57-6	2-Methylnaphthalene	**0.092J**	0.20	0.0099
91-20-3	Naphthalene	**0.16J**	0.20	0.011
85-01-8	Phenanthrene	**2.5**	0.20	0.039
129-00-0	Pyrene	**4.4**	0.20	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	75	*33-131*
2-Fluorobiphenyl	77	*46-122*
o-Terphenyl	93	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-106-0204**	Sampled:	05/25/11 13:15
Lab Sample ID:	**1105435-09**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	86		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.49**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:49	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-106-0204**	Sampled:	05/25/11 13:15
Lab Sample ID:	**1105435-09**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**86**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-109-0002**	Sampled:	05/25/11 11:15
Lab Sample ID:	**1105435-10**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	100	Analyzed:	06/09/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F09045
Percent Solids:	95		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	1.8U	1.8	0.35
208-96-8	Acenaphthylene	1.8U	1.8	0.35
120-12-7	Anthracene	1.8U	1.8	0.11
56-55-3	Benzo(a)anthracene	**0.58J**	1.8	0.35
50-32-8	Benzo(a)pyrene	**0.45J**	1.8	0.35
205-99-2	Benzo(b)fluoranthene	**0.55J**	1.8	0.21
207-08-9	Benzo(k)fluoranthene	**0.21J**	1.8	0.19
191-24-2	Benzo(g,h,i)perylene	**0.24J**	1.8	0.20
218-01-9	Chrysene	**0.48J**	1.8	0.13
53-70-3	Dibenz(a,h)anthracene	1.8U	1.8	1.8
206-44-0	Fluoranthene	**0.58J**	1.8	0.35
86-73-7	Fluorene	1.8U	1.8	0.21
193-39-5	Indeno(1,2,3-cd)pyrene	1.8U	1.8	0.21
91-57-6	2-Methylnaphthalene	1.8U	1.8	0.090
91-20-3	Naphthalene	1.8U	1.8	0.096
85-01-8	Phenanthrene	**0.55J**	1.8	0.35
129-00-0	Pyrene	**1.8**	1.8	0.12

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-109-0002**	Sampled:	05/25/11 11:15
Lab Sample ID:	**1105435-10**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	95		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.031**	**J**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:54	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-109-0002**	Sampled:	05/25/11 11:15
Lab Sample ID:	**1105435-10**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**95**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-109-0204**	Sampled:	05/25/11 11:20
Lab Sample ID:	**1105435-11**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	81		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.21U	0.21	0.041
208-96-8	Acenaphthylene	0.21U	0.21	0.041
120-12-7	Anthracene	**0.085J**	0.21	0.013
56-55-3	Benzo(a)anthracene	**0.39**	0.21	0.041
50-32-8	Benzo(a)pyrene	**0.37**	0.21	0.041
205-99-2	Benzo(b)fluoranthene	**0.46**	0.21	0.024
207-08-9	Benzo(k)fluoranthene	**0.20J**	0.21	0.022
191-24-2	Benzo(g,h,i)perylene	**0.19J**	0.21	0.023
218-01-9	Chrysene	**0.37**	0.21	0.015
53-70-3	Dibenz(a,h)anthracene	0.21U	0.21	0.21
206-44-0	Fluoranthene	**0.62**	0.21	0.041
86-73-7	Fluorene	0.21U	0.21	0.025
193-39-5	Indeno(1,2,3-cd)pyrene	**0.18J**	0.21	0.024
91-57-6	2-Methylnaphthalene	0.21U	0.21	0.011
91-20-3	Naphthalene	**0.013J**	0.21	0.011
85-01-8	Phenanthrene	**0.37**	0.21	0.041
129-00-0	Pyrene	**0.71**	0.21	0.014

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	73	*33-131*
2-Fluorobiphenyl	69	*46-122*
o-Terphenyl	83	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-109-0204**	Sampled:	05/25/11 11:20
Lab Sample ID:	**1105435-11**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	81		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.55**	0.046	0.0057	mg/kg dry wt.	1	USEPA-7471A	06/03/11 08:59	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-109-0204**	Sampled:	05/25/11 11:20
Lab Sample ID:	**1105435-11**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**81**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-110-0305**	Sampled:	05/25/11 11:55
Lab Sample ID:	**1105435-12**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	1	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F09040
Percent Solids:	84		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.0056J**	0.020	0.0040
208-96-8	Acenaphthylene	0.020U	0.020	0.0040
120-12-7	Anthracene	**0.0084J**	0.020	0.0013
56-55-3	Benzo(a)anthracene	**0.035**	0.020	0.0040
50-32-8	Benzo(a)pyrene	**0.022**	0.020	0.0040
205-99-2	Benzo(b)fluoranthene	**0.031**	0.020	0.0023
207-08-9	Benzo(k)fluoranthene	**0.0072J**	0.020	0.0021
191-24-2	Benzo(g,h,i)perylene	**0.012J**	0.020	0.0022
218-01-9	Chrysene	**0.029**	0.020	0.0015
53-70-3	Dibenz(a,h)anthracene	0.020U	0.020	0.020
206-44-0	Fluoranthene	**0.033**	0.020	0.0040
86-73-7	Fluorene	**0.0056J**	0.020	0.0024
193-39-5	Indeno(1,2,3-cd)pyrene	**0.010J**	0.020	0.0023
91-57-6	2-Methylnaphthalene	**0.0028J**	0.020	0.0010
91-20-3	Naphthalene	**0.0020J**	0.020	0.0011
85-01-8	Phenanthrene	**0.023**	0.020	0.0040
129-00-0	Pyrene	**0.059**	0.020	0.0013

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	66	*33-131*
2-Fluorobiphenyl	65	*46-122*
o-Terphenyl	65	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-110-0305**	Sampled:	05/25/11 11:55
Lab Sample ID:	**1105435-12**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	84		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.11**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 09:04	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-110-0305**	Sampled:	05/25/11 11:55
Lab Sample ID:	**1105435-12**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**84**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-110-0002**	Sampled:	05/25/11 11:50
Lab Sample ID:	**1105435-13**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	88		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.19U	0.19	0.038
208-96-8	Acenaphthylene	0.19U	0.19	0.038
120-12-7	Anthracene	**0.075J**	0.19	0.012
56-55-3	Benzo(a)anthracene	**0.47**	0.19	0.038
50-32-8	Benzo(a)pyrene	**0.44**	0.19	0.038
205-99-2	Benzo(b)fluoranthene	**0.60**	0.19	0.022
207-08-9	Benzo(k)fluoranthene	**0.22**	0.19	0.020
191-24-2	Benzo(g,h,i)perylene	**0.22**	0.19	0.021
218-01-9	Chrysene	**0.45**	0.19	0.014
53-70-3	Dibenz(a,h)anthracene	0.19U	0.19	0.19
206-44-0	Fluoranthene	**0.80**	0.19	0.038
86-73-7	Fluorene	0.19U	0.19	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**0.20**	0.19	0.022
91-57-6	2-Methylnaphthalene	**0.019J**	0.19	0.0096
91-20-3	Naphthalene	**0.023J**	0.19	0.010
85-01-8	Phenanthrene	**0.33**	0.19	0.038
129-00-0	Pyrene	**0.80**	0.19	0.013

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	72	*33-131*
2-Fluorobiphenyl	71	*46-122*
o-Terphenyl	79	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-110-0002**	Sampled:	05/25/11 11:50
Lab Sample ID:	**1105435-13**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	88		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.37**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 09:09	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-110-0002**	Sampled:	05/25/11 11:50
Lab Sample ID:	**1105435-13**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**88**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-111-0002**	Sampled:	05/25/11 12:20
Lab Sample ID:	**1105435-14**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	88		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.24**	0.19	0.038
208-96-8	Acenaphthylene	**0.089J**	0.19	0.038
120-12-7	Anthracene	**0.69**	0.19	0.012
56-55-3	Benzo(a)anthracene	**2.6**	0.19	0.038
50-32-8	Benzo(a)pyrene	**2.3**	0.19	0.038
205-99-2	Benzo(b)fluoranthene	**2.9**	0.19	0.022
207-08-9	Benzo(k)fluoranthene	**1.3**	0.19	0.020
191-24-2	Benzo(g,h,i)perylene	**1.1**	0.19	0.021
218-01-9	Chrysene	**2.3**	0.19	0.014
53-70-3	Dibenz(a,h)anthracene	**0.32**	0.19	0.19
206-44-0	Fluoranthene	**4.6**	0.19	0.038
86-73-7	Fluorene	**0.23**	0.19	0.023
193-39-5	Indeno(1,2,3-cd)pyrene	**1.2**	0.19	0.022
91-57-6	2-Methylnaphthalene	**0.056J**	0.19	0.0096
91-20-3	Naphthalene	**0.063J**	0.19	0.010
85-01-8	Phenanthrene	**3.4**	0.19	0.038
129-00-0	Pyrene	**5.1**	0.19	0.013

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	60	*33-131*
2-Fluorobiphenyl	82	*46-122*
o-Terphenyl	97	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-111-0002**	Sampled:	05/25/11 12:20
Lab Sample ID:	**1105435-14**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	88		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.64**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 09:14	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-111-0002**	Sampled:	05/25/11 12:20
Lab Sample ID:	**1105435-14**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**88**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-111-0305**	Sampled:	05/25/11 12:25
Lab Sample ID:	**1105435-15**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	2	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F09040
Percent Solids:	87		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.038U	0.038	0.0076
208-96-8	Acenaphthylene	0.038U	0.038	0.0076
120-12-7	Anthracene	**0.0055J**	0.038	0.0024
56-55-3	Benzo(a)anthracene	**0.014J**	0.038	0.0076
50-32-8	Benzo(a)pyrene	**0.0078J**	0.038	0.0076
205-99-2	Benzo(b)fluoranthene	**0.010J**	0.038	0.0045
207-08-9	Benzo(k)fluoranthene	**0.0070J**	0.038	0.0041
191-24-2	Benzo(g,h,i)perylene	**0.0078J**	0.038	0.0043
218-01-9	Chrysene	**0.015J**	0.038	0.0028
53-70-3	Dibenz(a,h)anthracene	0.038U	0.038	0.038
206-44-0	Fluoranthene	**0.013J**	0.038	0.0076
86-73-7	Fluorene	0.038U	0.038	0.0046
193-39-5	Indeno(1,2,3-cd)pyrene	**0.0063J**	0.038	0.0045
91-57-6	2-Methylnaphthalene	**0.025J**	0.038	0.0019
91-20-3	Naphthalene	**0.010J**	0.038	0.0021
85-01-8	Phenanthrene	**0.032J**	0.038	0.0076
129-00-0	Pyrene	**0.015J**	0.038	0.0025

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	72	*33-131*
2-Fluorobiphenyl	72	*46-122*
o-Terphenyl	74	*20-155*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-111-0305**	Sampled:	05/25/11 12:25
Lab Sample ID:	**1105435-15**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	87		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.050**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 09:19	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-111-0305**	Sampled:	05/25/11 12:25
Lab Sample ID:	**1105435-15**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**87**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-112-0002**	Sampled:	05/25/11 13:40
Lab Sample ID:	**1105435-16**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	2	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F09040
Percent Solids:	90		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.010J**	0.037	0.0074
208-96-8	Acenaphthylene	0.037U	0.037	0.0074
120-12-7	Anthracene	**0.029J**	0.037	0.0023
56-55-3	Benzo(a)anthracene	**0.14**	0.037	0.0074
50-32-8	Benzo(a)pyrene	**0.11**	0.037	0.0074
205-99-2	Benzo(b)fluoranthene	**0.16**	0.037	0.0043
207-08-9	Benzo(k)fluoranthene	**0.067**	0.037	0.0039
191-24-2	Benzo(g,h,i)perylene	**0.070**	0.037	0.0042
218-01-9	Chrysene	**0.12**	0.037	0.0027
53-70-3	Dibenz(a,h)anthracene	0.037U	0.037	0.037
206-44-0	Fluoranthene	**0.16**	0.037	0.0074
86-73-7	Fluorene	**0.014J**	0.037	0.0044
193-39-5	Indeno(1,2,3-cd)pyrene	**0.064**	0.037	0.0043
91-57-6	2-Methylnaphthalene	**0.017J**	0.037	0.0019
91-20-3	Naphthalene	**0.015J**	0.037	0.0020
85-01-8	Phenanthrene	**0.13**	0.037	0.0074
129-00-0	Pyrene	**0.25**	0.037	0.0025

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	74	*33-131*
2-Fluorobiphenyl	72	*46-122*
o-Terphenyl	70	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-112-0002**	Sampled:	05/25/11 13:40
Lab Sample ID:	**1105435-16**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	90		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.54**	0.047	0.0057	mg/kg dry wt.	1	USEPA-7471A	06/03/11 09:24	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-112-0002**	Sampled:	05/25/11 13:40
Lab Sample ID:	**1105435-16**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**90**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-112-0204**	Sampled:	05/25/11 13:45
Lab Sample ID:	**1105435-17**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	2	Analyzed:	06/09/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F09040
Percent Solids:	83		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.040U	0.040	0.0080
208-96-8	Acenaphthylene	0.040U	0.040	0.0080
120-12-7	Anthracene	**0.013J**	0.040	0.0025
56-55-3	Benzo(a)anthracene	**0.086**	0.040	0.0080
50-32-8	Benzo(a)pyrene	**0.081**	0.040	0.0080
205-99-2	Benzo(b)fluoranthene	**0.11**	0.040	0.0047
207-08-9	Benzo(k)fluoranthene	**0.031J**	0.040	0.0043
191-24-2	Benzo(g,h,i)perylene	**0.052**	0.040	0.0045
218-01-9	Chrysene	**0.075**	0.040	0.0029
53-70-3	Dibenz(a,h)anthracene	0.040U	0.040	0.040
206-44-0	Fluoranthene	**0.11**	0.040	0.0080
86-73-7	Fluorene	0.040U	0.040	0.0048
193-39-5	Indeno(1,2,3-cd)pyrene	**0.048**	0.040	0.0047
91-57-6	2-Methylnaphthalene	**0.0095J**	0.040	0.0021
91-20-3	Naphthalene	**0.0055J**	0.040	0.0022
85-01-8	Phenanthrene	**0.069**	0.040	0.0080
129-00-0	Pyrene	**0.14**	0.040	0.0027

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	70	*33-131*
2-Fluorobiphenyl	70	*46-122*
o-Terphenyl	75	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-112-0204**	Sampled:	05/25/11 13:45
Lab Sample ID:	**1105435-17**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	83		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.49**	0.047	0.0057	mg/kg dry wt.	1	USEPA-7471A	06/03/11 09:29	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-112-0204**	Sampled:	05/25/11 13:45
Lab Sample ID:	**1105435-17**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**83**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-115-0204**	Sampled:	05/25/11 14:00
Lab Sample ID:	**1105435-18**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	10	Analyzed:	06/08/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F08051
Percent Solids:	83		

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.12J**	0.20	0.040
208-96-8	Acenaphthylene	0.20U	0.20	0.040
120-12-7	Anthracene	**0.31**	0.20	0.013
56-55-3	Benzo(a)anthracene	**0.76**	0.20	0.040
50-32-8	Benzo(a)pyrene	**0.67**	0.20	0.040
205-99-2	Benzo(b)fluoranthene	**0.95**	0.20	0.024
207-08-9	Benzo(k)fluoranthene	**0.28**	0.20	0.022
191-24-2	Benzo(g,h,i)perylene	**0.33**	0.20	0.023
218-01-9	Chrysene	**0.68**	0.20	0.015
53-70-3	Dibenz(a,h)anthracene	0.20U	0.20	0.20
206-44-0	Fluoranthene	**1.4**	0.20	0.040
86-73-7	Fluorene	**0.095J**	0.20	0.024
193-39-5	Indeno(1,2,3-cd)pyrene	**0.32**	0.20	0.024
91-57-6	2-Methylnaphthalene	**0.041J**	0.20	0.010
91-20-3	Naphthalene	**0.033J**	0.20	0.011
85-01-8	Phenanthrene	**1.1**	0.20	0.040
129-00-0	Pyrene	**1.5**	0.20	0.013

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	60	*33-131*
2-Fluorobiphenyl	61	*46-122*
o-Terphenyl	72	*20-155*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-115-0204**	Sampled:	05/25/11 14:00
Lab Sample ID:	**1105435-18**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	83		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**1.3**	0.25	0.030	mg/kg dry wt.	5	USEPA-7471A	06/03/11 14:29	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SB-115-0204**	Sampled:	05/25/11 14:00
Lab Sample ID:	**1105435-18**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**83**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	*USCG Atwater Facility*	Description:	Laboratory Services
Client Sample ID:	**DA-SS-115-0002**	Sampled:	05/25/11 13:55
Lab Sample ID:	**1105435-19**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/kg dry	Prepared:	06/03/11 By: BJH
Dilution Factor:	100	Analyzed:	06/09/11 By: JLB
QC Batch:	1105392	Analytical Batch:	1F09045
Percent Solids:	89		

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	1.9U	1.9	0.37
208-96-8	Acenaphthylene	1.9U	1.9	0.37
120-12-7	Anthracene	1.9U	1.9	0.12
56-55-3	Benzo(a)anthracene	**0.50J**	1.9	0.37
50-32-8	Benzo(a)pyrene	**0.46J**	1.9	0.37
205-99-2	Benzo(b)fluoranthene	**0.50J**	1.9	0.22
207-08-9	Benzo(k)fluoranthene	**0.42J**	1.9	0.20
191-24-2	Benzo(g,h,i)perylene	**0.53J**	1.9	0.21
218-01-9	Chrysene	**0.46J**	1.9	0.14
53-70-3	Dibenz(a,h)anthracene	1.9U	1.9	1.9
206-44-0	Fluoranthene	**0.61J**	1.9	0.37
86-73-7	Fluorene	1.9U	1.9	0.22
193-39-5	Indeno(1,2,3-cd)pyrene	1.9U	1.9	0.22
91-57-6	2-Methylnaphthalene	1.9U	1.9	0.096
91-20-3	Naphthalene	1.9U	1.9	0.10
85-01-8	Phenanthrene	**0.69J**	1.9	0.37
129-00-0	Pyrene	**1.8J**	1.9	0.12

*See Statement of Data Qualifications

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-115-0002**	Sampled:	05/25/11 13:55
Lab Sample ID:	**1105435-19**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	89		

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Mercury	**0.54**	0.050	0.0061	mg/kg dry wt.	1	USEPA-7471A	06/03/11 10:04	DSC	1105367

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-SS-115-0002**	Sampled:	05/25/11 13:55
Lab Sample ID:	**1105435-19**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Percent Solids	**89**	0.1	0.1	%	1	USEPA-3550B	06/01/11 11:00	CLB	1105294

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GROUNDWATER – JUNE 2011

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-01-062011**	Sampled:	06/06/11 14:10
Lab Sample ID:	**1106105-01**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/10/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F10052

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.50U	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	0.50U	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	70	*40-110*
2-Fluorobiphenyl	57	*50-110*
o-Terphenyl	73	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/10/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**6.0**	0.50	0.029
208-96-8	Acenaphthylene	**1.7**	0.50	0.036
120-12-7	Anthracene	**3.8**	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.28J**	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	**0.050J**	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	**0.10J**	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.52**	0.50	0.033
86-73-7	Fluorene	**3.5**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	**24**	0.50	0.036
*91-20-3	Naphthalene	**63**	0.50	0.031
85-01-8	Phenanthrene	**8.8**	0.50	0.035
129-00-0	Pyrene	**0.39J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	54	*40-110*
2-Fluorobiphenyl	**42**	*50-110*
o-Terphenyl	73	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02RE1**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	10	Analyzed:	06/13/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F14026

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**8.1**	5.0	0.29
208-96-8	Acenaphthylene	5.0U	5.0	0.36
120-12-7	Anthracene	**3.6J**	5.0	0.38
56-55-3	Benzo(a)anthracene	**0.50J**	5.0	0.32
50-32-8	Benzo(a)pyrene	5.0U	5.0	0.29
205-99-2	Benzo(b)fluoranthene	5.0U	5.0	0.68
207-08-9	Benzo(k)fluoranthene	5.0U	5.0	0.40
191-24-2	Benzo(g,h,i)perylene	5.0U	5.0	2.7
218-01-9	Chrysene	5.0U	5.0	0.36
53-70-3	Dibenz(a,h)anthracene	5.0U	5.0	1.2
206-44-0	Fluoranthene	**0.50J**	5.0	0.33
86-73-7	Fluorene	**4.8J**	5.0	0.44
193-39-5	Indeno(1,2,3-cd)pyrene	5.0U	5.0	1.1
91-57-6	2-Methylnaphthalene	**35**	5.0	0.36
91-20-3	Naphthalene	**120**	5.0	0.31
85-01-8	Phenanthrene	**8.3**	5.0	0.35
129-00-0	Pyrene	**0.90J**	5.0	0.38

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	57	*40-110*
2-Fluorobiphenyl	59	*50-110*
o-Terphenyl	85	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-03-062011**	Sampled:	06/06/11 15:15
Lab Sample ID:	**1106105-03**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/11/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**1.6**	0.50	0.029
208-96-8	Acenaphthylene	**0.050J**	0.50	0.036
120-12-7	Anthracene	**0.22J**	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.20J**	0.50	0.033
86-73-7	Fluorene	**0.36J**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	**0.070J**	0.50	0.036
91-20-3	Naphthalene	**0.19J**	0.50	0.031
85-01-8	Phenanthrene	**1.2**	0.50	0.035
129-00-0	Pyrene	**0.15J**	0.50	0.038

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	72	*40-110*
2-Fluorobiphenyl	63	*50-110*
o-Terphenyl	76	*50-135*

This report shall not be reproduced, except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.
5560 Corporate Exchange Court SE ♦ Grand Rapids, MI 49512 ♦ 616.975.4500 ♦ Fax 616.942.7463 ♦ www.trimatrixlabs.com

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-04-062011**	Sampled:	06/06/11 13:34
Lab Sample ID:	**1106105-04**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/11/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.050J**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	**0.050J**	0.50	0.031
85-01-8	Phenanthrene	**0.050J**	0.50	0.035
129-00-0	Pyrene	**0.040J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	74	*40-110*
2-Fluorobiphenyl	62	*50-110*
o-Terphenyl	75	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-FD-01**	Sampled:	06/06/11 00:00
Lab Sample ID:	**1106105-05**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/11/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**1.6**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	**0.19J**	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.15J**	0.50	0.033
86-73-7	Fluorene	**0.27J**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	**0.11J**	0.50	0.031
85-01-8	Phenanthrene	**1.0**	0.50	0.035
129-00-0	Pyrene	**0.13J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	70	*40-110*
2-Fluorobiphenyl	60	*50-110*
o-Terphenyl	71	*50-135*

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DATA VALIDATION REPORTS

DATA VALIDATION REPORTS ARE PROVIDED ON CD

LABORATORY CERTIFICATIONS

FLORIDA DEPARTMENT OF HEALTH

State of Florida
Department of Health, Bureau of Laboratories

This is to certify that

E87622

TRIMATRIX LABORATORIES, INC.
5560 CORPORATE EXCHANGE COURT SE
GRAND RAPIDS, MI 49512

has complied with Florida Administrative Code 64E-1,
for the examination of Environmental samples in the following categories

DRINKING WATER - GROUP II UNREGULATED CONTAMINANTS, DRINKING WATER - OTHER REGULATED CONTAMINANTS, DRINKING WATER - PRIMARY INORGANIC CONTAMINANTS, DRINKING WATER - SECONDARY INORGANIC CONTAMINANTS, NON-POTABLE WATER - EXTRACTABLE ORGANICS, NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - METALS, NON-POTABLE WATER - PESTICIDES-HERBICIDES-PCB'S, NON-POTABLE WATER - VOLATILE ORGANICS, SOLID AND CHEMICAL MATERIALS - EXTRACTABLE ORGANICS, SOLID AND CHEMICAL MATERIALS - GENERAL CHEMISTRY, SOLID AND CHEMICAL MATERIALS - METALS, SOLID AND CHEMICAL MATERIALS - PESTICIDES-HERBICIDES-PCB'S, SOLID AND CHEMICAL MATERIALS - VOLATILE ORGANICS

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

EFFECTIVE July 01, 2009 THROUGH June 30, 2010

Max Salfinger, M.D.
Chief, Bureau of Laboratories
Florida Department of Health
DH Form 1697, 7/04
NON-TRANSFERABLE E87622-12-07/01/2009
Supersedes all previously issued certificates

Charlie Crist
Governor

Ana M. Viamonte Ros, M.D., M.P.H.
State Surgeon General

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1,1-Trichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1,2,2-Tetrachloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1,2-Trichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1-Dichloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1-Dichloropropene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,3-Trichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,3-Trichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,4-Trichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,4-Trimethylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2-Dichlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,2-Dichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,2-Dichloropropane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,3,5-Trimethylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,3-Dichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,3-Dichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,4-Dichlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
2,2-Dichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
2-Chlorotoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
4-Chlorotoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
4-Isopropyltoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Alkalinity as CaCO3	SM 2320 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Aluminum	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Antimony	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Arsenic	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Barium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Benzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Beryllium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Bromobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromochloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromodichloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromoform	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Cadmium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Calcium	EPA 200.7	Primary Inorganic Contaminants	NELAP	1/24/2001
Carbon tetrachloride	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003

Clients and Customers are urged to verify the laboratory's current certification status with the Environmental Laboratory Certification Program. **Issue Date: 7/1/2009** **Expiration Date: 6/30/2010**

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chloride	EPA 300.0	Secondary Inorganic Contaminants	NELAP	5/19/2003
Chlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Chloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Chloroform	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Chromium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
cis-1,3-Dichloropropene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Color	SM 2120 B	Secondary Inorganic Contaminants	NELAP	7/24/2008
Conductivity	SM 2510 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Copper	EPA 200.7	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	NELAP	1/24/2001
Copper	EPA 200.8	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	NELAP	1/24/2001
Cyanide	SM 4500-CN E	Primary Inorganic Contaminants	NELAP	7/24/2008
Dibromochloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dibromomethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dichlorodifluoromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dichloromethane (DCM, Methylene chloride)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Ethylbenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Fluoride	SM 4500 F-C	Primary Inorganic Contaminants	NELAP	5/19/2003
Hardness	SM 2340 B	Secondary Inorganic Contaminants	NELAP	7/24/2008
Hardness	SM 2340 C	Secondary Inorganic Contaminants	NELAP	7/24/2008
Hexachlorobutadiene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Iron	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Isopropylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Lead	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Manganese	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Manganese	EPA 200.8	Secondary Inorganic Contaminants	NELAP	1/24/2001
Mercury	EPA 245.1	Primary Inorganic Contaminants	NELAP	5/19/2003
Methyl bromide (Bromomethane)	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Methyl chloride (Chloromethane)	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Naphthalene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Nickel	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Nitrate as N	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
Nitrate as N	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Nitrite	SM 4500-NO2 B	Primary Inorganic Contaminants	NELAP	5/19/2003

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Nitrite	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Nitrite as N	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
n-Propylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Orthophosphate as P	SM 4500-P E	Primary Inorganic Contaminants	NELAP	7/24/2008
pH	SM 4500-H B	Primary Inorganic Contaminants	NELAP	5/19/2003
Residue-filterable (TDS)	SM 2540 C	Secondary Inorganic Contaminants	NELAP	9/9/2005
Selenium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Silver	EPA 200.8	Secondary Inorganic Contaminants	NELAP	1/24/2001
Sodium	EPA 200.7	Primary Inorganic Contaminants	NELAP	1/24/2001
Styrene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Sulfate	EPA 300.0	Secondary Inorganic Contaminants	NELAP	5/19/2003
Tetrachloroethylene (Perchloroethylene)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Thallium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Toluene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Total nitrate-nitrite	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
Total nitrate-nitrite	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Total organic carbon	SM 5310C	Primary Inorganic Contaminants	NELAP	7/24/2008
Total trihalomethanes	EPA 524.2	Other Regulated Contaminants	NELAP	7/24/2008
trans-1,2-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
trans-1,3-Dichloropropylene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Trichloroethene (Trichloroethylene)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Trichlorofluoromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Turbidity	SM 2130 B	Secondary Inorganic Contaminants	NELAP	5/19/2003
Vinyl chloride	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Xylene (total)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Zinc	EPA 200.7	Secondary Inorganic Contaminants	NELAP	4/20/2001
Zinc	EPA 200.8	Secondary Inorganic Contaminants	NELAP	4/20/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1,1,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,1-Trichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,1-Trichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1,2,2-Tetrachloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,2,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,2-Trichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,2-Trichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1-Dichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethylene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1-Dichloropropene	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1-Dichloropropene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,3-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2,3-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,3-Trichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2,3-Trichloropropane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2,4,5-Tetrachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,2,4-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8021	Volatile Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,2-Dichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Dichloropropane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Diphenylhydrazine	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330	Extractable Organics	NELAP	7/24/2008
1,3-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,3-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,3-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3-Dichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,3-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330	Extractable Organics	NELAP	7/24/2008
1,3-Tolualdehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
1,4-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,4-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,4-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,4-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,4-Dioxane (1,4-Diethyleneoxide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,4-Naphthoquinone	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,4-Phenylenediamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
1-Chlorohexane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1-Methylnaphthalene (added to method at FDEP request)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1-Naphthylamine	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
2,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
2,3,4,6-Tetrachlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,5-T	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4,5-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,6-Trichlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4,6-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2,4-D	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-DB	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-Dichlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dimethylphenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dimethylphenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dinitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dinitrotoluene (2,4-DNT)	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270	Extractable Organics	NELAP	9/2/2005
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2,6-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,6-Dinitrotoluene (2,6-DNT)	EPA 625	Extractable Organics	NELAP	1/24/2001
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270	Extractable Organics	NELAP	9/2/2005
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Acetylaminofluorene	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330	Extractable Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Chloroethyl vinyl ether	EPA 601	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 624	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8021	Volatile Organics	NELAP	7/24/2008
2-Chloroethyl vinyl ether	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Chloronaphthalene	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Chloronaphthalene	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Chlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Chlorophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Chlorotoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
2-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
2-Hexanone	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Methyl-4,6-dinitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Methyl-4,6-dinitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Methylnaphthalene	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Methylphenol (o-Cresol)	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Naphthylamine	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Nitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Nitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Nitropropane	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Picoline (2-Methylpyridine)	EPA 8270	Extractable Organics	NELAP	9/2/2005
3,3'-Dichlorobenzidine	EPA 625	Extractable Organics	NELAP	1/24/2001
3,3'-Dichlorobenzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
3,3'-Dimethylbenzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Methylcholanthrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Methylphenol (m-Cresol)	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
3-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
4,4'-DDD	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDD	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4,4'-DDE	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDE	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4,4'-DDT	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDT	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330	Extractable Organics	NELAP	7/24/2008
4-Aminobiphenyl	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Bromophenyl phenyl ether	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Bromophenyl phenyl ether	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chloro-3-methylphenol	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Chloro-3-methylphenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chloroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Chlorophenyl phenylether	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Chlorophenyl phenylether	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chlorotoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
4-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
4-Dimethyl aminoazobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Methyl-2-pentanone (MIBK)	EPA 8260	Volatile Organics	NELAP	7/24/2008
4-Methylphenol (p-Cresol)	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Nitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Nitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
5-Nitro-o-toluidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
7,12-Dimethylbenz(a) anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
a-a-Dimethylphenethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Acenaphthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Acenaphthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Acenaphthylene	EPA 610	Extractable Organics	NELAP	7/24/2008
Acenaphthylene	EPA 625	Extractable Organics	NELAP	1/24/2001
Acenaphthylene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthylene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Acetaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
Acetone	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acetonitrile	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acetophenone	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acrolein (Propenal)	EPA 624	Volatile Organics	NELAP	5/19/2003
Acrolein (Propenal)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acrylonitrile	EPA 624	Volatile Organics	NELAP	5/19/2003

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Acrylonitrile	EPA 8260	Volatile Organics	NELAP	9/2/2005
Aldrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Alkalinity as CaCO3	SM 2320 B	General Chemistry	NELAP	9/2/2005
Allyl chloride (3-Chloropropene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
alpha-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Aluminum	EPA 200.7	Metals	NELAP	1/24/2001
Aluminum	EPA 6010	Metals	NELAP	9/2/2005
Amenable cyanide	SM 4500 CN-G	General Chemistry	NELAP	5/19/2003
Ammonia as N	SM 4500-NH3 G	General Chemistry	NELAP	5/19/2003
Aniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
Anthracene	EPA 610	Extractable Organics	NELAP	7/24/2008
Anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Antimony	EPA 200.7	Metals	NELAP	1/24/2001
Antimony	EPA 200.8	Metals	NELAP	1/24/2001
Antimony	EPA 6010	Metals	NELAP	9/2/2005
Antimony	EPA 6020	Metals	NELAP	9/2/2005
Aramite	EPA 8270	Extractable Organics	NELAP	9/2/2005
Aroclor-1016 (PCB-1016)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1016 (PCB-1016)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1221 (PCB-1221)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1221 (PCB-1221)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Aroclor-1232 (PCB-1232)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1232 (PCB-1232)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1242 (PCB-1242)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1242 (PCB-1242)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1248 (PCB-1248)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1248 (PCB-1248)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1254 (PCB-1254)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1254 (PCB-1254)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1260 (PCB-1260)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1260 (PCB-1260)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Arsenic	EPA 200.7	Metals	NELAP	1/24/2001
Arsenic	EPA 200.8	Metals	NELAP	1/24/2001
Arsenic	EPA 6010	Metals	NELAP	9/2/2005
Arsenic	EPA 6020	Metals	NELAP	9/2/2005
Available cyanide	OIA 1677	General Chemistry	NELAP	9/9/2005
Barium	EPA 200.7	Metals	NELAP	1/24/2001
Barium	EPA 200.8	Metals	NELAP	1/24/2001
Barium	EPA 6010	Metals	NELAP	9/2/2005
Barium	EPA 6020	Metals	NELAP	9/2/2005
Benzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Benzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Benzidine	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)anthracene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(a)anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(a)anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(a)pyrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(a)pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(a)pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(b)fluoranthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(b)fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(b)fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(b)fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(g,h,i)perylene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(g,h,i)perylene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(g,h,i)perylene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(g,h,i)perylene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(k)fluoranthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(k)fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(k)fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(k)fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzoic acid	EPA 8270	Extractable Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Benzyl alcohol	EPA 8270	Extractable Organics	NELAP	7/24/2008
Beryllium	EPA 200.7	Metals	NELAP	1/24/2001
Beryllium	EPA 200.8	Metals	NELAP	1/24/2001
Beryllium	EPA 6010	Metals	NELAP	9/2/2005
Beryllium	EPA 6020	Metals	NELAP	9/2/2005
beta-BHC (beta-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Biochemical oxygen demand	SM 5210 B	General Chemistry	NELAP	5/19/2003
bis(2-Chloroethoxy)methane	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Chloroethoxy)methane	EPA 8270	Extractable Organics	NELAP	9/2/2005
bis(2-Chloroethyl) ether	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Chloroethyl) ether	EPA 8270	Extractable Organics	NELAP	9/2/2005
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 625	Extractable Organics	NELAP	7/24/2008
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 8270	Extractable Organics	NELAP	7/24/2008
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Boron	EPA 200.7	Metals	NELAP	1/24/2001
Boron	EPA 6010	Metals	NELAP	9/2/2005
Bromobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromochloromethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromochloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromodichloromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Bromodichloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromoform	EPA 601	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 624	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8021	Volatile Organics	NELAP	9/2/2005
Bromoform	EPA 8260	Volatile Organics	NELAP	9/2/2005
Butanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Butyl benzyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Butyl benzyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Cadmium	EPA 200.7	Metals	NELAP	1/24/2001
Cadmium	EPA 200.8	Metals	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Cadmium	EPA 6010	Metals	NELAP	9/2/2005
Cadmium	EPA 6020	Metals	NELAP	9/2/2005
Calcium	EPA 200.7	Metals	NELAP	1/24/2001
Calcium	EPA 6010	Metals	NELAP	9/2/2005
Carbazole	EPA 8270	Extractable Organics	NELAP	7/24/2008
Carbon disulfide	EPA 8260	Volatile Organics	NELAP	7/24/2008
Carbon tetrachloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Carbon tetrachloride	EPA 8260	Volatile Organics	NELAP	9/2/2005
Carbonaceous BOD (CBOD)	SM 5210 B	General Chemistry	NELAP	5/19/2003
Chemical oxygen demand	SM 5220 D	General Chemistry	NELAP	5/19/2003
Chlordane (tech.)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chlordane (tech.)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Chloride	EPA 300.0	General Chemistry	NELAP	5/19/2003
Chloride	EPA 9056	General Chemistry	NELAP	9/2/2005
Chloride	SM 4500-Cl E	General Chemistry	NELAP	5/19/2003
Chlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chlorobenzilate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Chloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chloroform	EPA 601	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 624	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chloroform	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chloroprene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chromium	EPA 200.7	Metals	NELAP	1/24/2005
Chromium	EPA 200.8	Metals	NELAP	1/24/2001
Chromium	EPA 6010	Metals	NELAP	9/2/2005
Chromium	EPA 6020	Metals	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chromium VI	EPA 7196	General Chemistry	NELAP	7/24/2008
Chromium VI	SM 3500-Cr B (20th/21st Ed.)/UV-VIS	General Chemistry	NELAP	9/2/2005
Chrysene	EPA 610	Extractable Organics	NELAP	7/24/2008
Chrysene	EPA 625	Extractable Organics	NELAP	1/24/2001
Chrysene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Chrysene	EPA 8310	Extractable Organics	NELAP	7/24/2008
cis-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	7/24/2008
cis-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
cis-1,3-Dichloropropene	EPA 601	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 624	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8021	Volatile Organics	NELAP	7/24/2008
cis-1,3-Dichloropropene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Cobalt	EPA 200.7	Metals	NELAP	1/24/2001
Cobalt	EPA 200.8	Metals	NELAP	1/24/2001
Cobalt	EPA 6010	Metals	NELAP	9/2/2005
Cobalt	EPA 6020	Metals	NELAP	9/2/2005
Color	SM 2120 B	General Chemistry	NELAP	7/24/2008
Conductivity	SM 2510 B	General Chemistry	NELAP	9/2/2005
Copper	EPA 200.7	Metals	NELAP	1/24/2001
Copper	EPA 200.8	Metals	NELAP	1/24/2001
Copper	EPA 6010	Metals	NELAP	9/2/2005
Copper	EPA 6020	Metals	NELAP	9/2/2005
Crotonaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
Cyclohexanone	EPA 8315	Extractable Organics	NELAP	7/24/2008
Dalapon	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Decanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
delta-BHC	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
delta-BHC	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Diallate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Dibenz(a,h)anthracene	EPA 610	Extractable Organics	NELAP	7/24/2008
Dibenz(a,h)anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Dibenz(a,h)anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Dibenz(a,h)anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Dibenzofuran	EPA 8270	Extractable Organics	NELAP	7/24/2008
Dibromochloromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 624	Volatile Organics	NELAP	1/24/2001

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Dibromochloromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Dibromochloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Dibromomethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dibromomethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dicamba	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Dichlorodifluoromethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Dichloroprop (Dichlorprop)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dieldrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dieldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Diesel range organics (DRO)	EPA 8015	Extractable Organics	NELAP	7/24/2008
Diethyl ether	EPA 8260	Volatile Organics	NELAP	7/24/2008
Diethyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Diethyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-isopropylether (DIPE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dimethoate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Dimethyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Dimethyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-n-butyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Di-n-butyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-n-octyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Di-n-octyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270	Extractable Organics	NELAP	7/24/2008
Disulfoton	EPA 8270	Extractable Organics	NELAP	7/24/2008
Endosulfan I	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan I	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endosulfan II	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan II	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endosulfan sulfate	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan sulfate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin aldehyde	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin aldehyde	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Endrin ketone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Ethane	RSK-175	Volatile Organics	NELAP	9/2/2005
Ethanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
Ethanol	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl acetate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl methacrylate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Ethylbenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Ethylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethylene	RSK-175	Volatile Organics	NELAP	9/2/2005
Famphur	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Fluoranthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Fluorene	EPA 610	Extractable Organics	NELAP	7/24/2008
Fluorene	EPA 625	Extractable Organics	NELAP	1/24/2001
Fluorene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Fluorene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Fluoride	EPA 300.0	General Chemistry	NELAP	5/19/2003
Fluoride	EPA 9056	General Chemistry	NELAP	9/2/2005
Fluoride	SM 4500 F-C	General Chemistry	NELAP	5/19/2003
Formaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
gamma-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Gasoline range organics (GRO)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Hardness	SM 2340 B	General Chemistry	NELAP	7/24/2008
Hardness	SM 2340 C	General Chemistry	NELAP	5/19/2003
Heptachlor	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Heptachlor epoxide	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor epoxide	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Heptanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Hexachlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachlorobutadiene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorobutadiene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Hexachlorobutadiene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachlorocyclopentadiene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorocyclopentadiene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachloroethane	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Hexachloroethane	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachloropropene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Indeno(1,2,3-cd)pyrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Indeno(1,2,3-cd)pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Indeno(1,2,3-cd)pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Indeno(1,2,3-cd)pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Iodomethane (Methyl iodide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Iron	EPA 200.7	Metals	NELAP	1/24/2001
Iron	EPA 6010	Metals	NELAP	9/2/2005
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Isodrin	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Isophorone	EPA 625	Extractable Organics	NELAP	1/24/2001
Isophorone	EPA 8270	Extractable Organics	NELAP	9/2/2005
Isopropyl alcohol (2-Propanol)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Isopropyl alcohol (2-Propanol)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Isopropylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Isosafrole	EPA 8270	Extractable Organics	NELAP	9/2/2005
Kepone	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Kjeldahl nitrogen - total	EPA 351.2	General Chemistry	NELAP	1/24/2001
Lead	EPA 200.7	Metals	NELAP	1/24/2001
Lead	EPA 200.8	Metals	NELAP	1/24/2001
Lead	EPA 6010	Metals	NELAP	9/2/2005
Lead	EPA 6020	Metals	NELAP	9/2/2005
Lithium	EPA 200.7	Metals	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Lithium	EPA 6010	Metals	NELAP	9/2/2005
m+p-Xylenes	EPA 8260	Volatile Organics	NELAP	7/24/2008
Magnesium	EPA 200.7	Metals	NELAP	1/24/2001
Magnesium	EPA 6010	Metals	NELAP	9/2/2005
Manganese	EPA 200.7	Metals	NELAP	1/24/2001
Manganese	EPA 200.8	Metals	NELAP	1/24/2001
Manganese	EPA 6010	Metals	NELAP	9/2/2005
Manganese	EPA 6020	Metals	NELAP	9/2/2005
MCPA	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
MCPP	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Mercury	EPA 1631	Metals	NELAP	9/9/2005
Mercury	EPA 245.1	Metals	NELAP	5/19/2003
Mercury	EPA 7470	Metals	NELAP	7/24/2008
Methacrylonitrile	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methane	RSK-175	Volatile Organics	NELAP	9/2/2005
Methanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
Methapyrilene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Methoxychlor	EPA 608.2	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methoxychlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Methyl bromide (Bromomethane)	EPA 601	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 624	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methyl bromide (Bromomethane)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl chloride (Chloromethane)	EPA 601	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 624	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methyl chloride (Chloromethane)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl methacrylate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Methyl parathion (Parathion, methyl)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Methyl tert-butyl ether (MTBE)	EPA 8021	Volatile Organics	NELAP	7/24/2008
Methyl tert-butyl ether (MTBE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Methylene chloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methylene chloride	EPA 8260	Volatile Organics	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Molybdenum	EPA 200.7	Metals	NELAP	1/24/2001
Molybdenum	EPA 200.8	Metals	NELAP	1/24/2001
Molybdenum	EPA 6010	Metals	NELAP	9/2/2005
Molybdenum	EPA 6020	Metals	NELAP	9/2/2005
Naphthalene	EPA 610	Extractable Organics	NELAP	7/24/2008
Naphthalene	EPA 625	Extractable Organics	NELAP	1/24/2001
Naphthalene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Naphthalene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Naphthalene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Naphthalene	EPA 8310	Extractable Organics	NELAP	7/24/2008
n-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	7/24/2008
n-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	9/2/2005
n-Butylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
n-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Nickel	EPA 200.7	Metals	NELAP	1/24/2001
Nickel	EPA 200.8	Metals	NELAP	1/24/2001
Nickel	EPA 6010	Metals	NELAP	9/2/2005
Nickel	EPA 6020	Metals	NELAP	9/2/2005
Nitrate	EPA 9056	General Chemistry	NELAP	9/2/2005
Nitrate as N	EPA 300.0	General Chemistry	NELAP	5/19/2003
Nitrate as N	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Nitrite	EPA 9056	General Chemistry	NELAP	9/2/2005
Nitrite	SM 4500-NO2 B	General Chemistry	NELAP	5/19/2003
Nitrite	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Nitrite as N	EPA 300.0	General Chemistry	NELAP	5/19/2003
Nitrobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
Nitrobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Nitrobenzene	EPA 8330	Extractable Organics	NELAP	7/24/2008
Nitroquinoline-1-oxide	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodiethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodimethylamine	EPA 625	Extractable Organics	NELAP	1/24/2001
n-Nitrosodimethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitroso-di-n-butylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodi-n-propylamine	EPA 625	Extractable Organics	NELAP	1/24/2001
n-Nitrosodi-n-propylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodiphenylamine	EPA 625	Extractable Organics	NELAP	1/24/2001

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E87622
TriMatrix Laboratories, Inc.
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Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
n-Nitrosodiphenylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosomethylethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosomorpholine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosopiperidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosopyrrolidine	EPA 8270	Extractable Organics	NELAP	7/24/2008
Nonanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
n-Propanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
n-Propanol	EPA 8260	Volatile Organics	NELAP	7/24/2008
n-Propylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
o,o,o-Triethyl phosphorothioate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Octanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Oil & Grease	EPA 1664A	General Chemistry	NELAP	1/24/2001
Oil & Grease	EPA 9070	General Chemistry	NELAP	9/2/2005
Orthophosphate as P	SM 4500-P E	General Chemistry	NELAP	9/2/2005
o-Toluidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
o-Xylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Parathion, ethyl	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Pentachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentachloronitrobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentachlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
Pentachlorophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentanal (Valeraldehyde)	EPA 8315	Extractable Organics	NELAP	7/24/2008
pH	EPA 9040	General Chemistry	NELAP	7/24/2008
pH	SM 4500-H B	General Chemistry	NELAP	5/19/2003
Phenacetin	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phenanthrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Phenanthrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Phenanthrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phenanthrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Phenol	EPA 625	Extractable Organics	NELAP	1/24/2001
Phenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phorate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phosphorus, total	SM 4500-P F	General Chemistry	NELAP	7/24/2008
p-Isopropyltoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
p-Isopropyltoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Potassium	EPA 200.7	Metals	NELAP	1/24/2001
Potassium	EPA 6010	Metals	NELAP	9/2/2005
Pronamide (Kerb)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Propanal (Propionaldehyde)	EPA 8315	Extractable Organics	NELAP	7/24/2008
Propionitrile (Ethyl cyanide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Pyrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Pyridine	EPA 8270	Extractable Organics	NELAP	7/24/2008
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Residue-filterable (TDS)	SM 2540 C	General Chemistry	NELAP	9/2/2005
Residue-nonfilterable (TSS)	SM 2540 D	General Chemistry	NELAP	9/2/2005
Residue-settleable	SM 2540 F	General Chemistry	NELAP	7/24/2008
Residue-total	SM 2540 B	General Chemistry	NELAP	9/2/2005
Residue-volatile	EPA 160.4	General Chemistry	NELAP	1/24/2001
Safrole	EPA 8270	Extractable Organics	NELAP	9/2/2005
sec-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Selenium	EPA 200.7	Metals	NELAP	1/24/2001
Selenium	EPA 200.8	Metals	NELAP	1/24/2001
Selenium	EPA 6010	Metals	NELAP	9/2/2005
Selenium	EPA 6020	Metals	NELAP	9/2/2005
Silicon	EPA 200.7	Metals	NELAP	1/24/2001
Silicon	EPA 6010	Metals	NELAP	9/2/2005
Silver	EPA 200.7	Metals	NELAP	1/24/2001
Silver	EPA 200.8	Metals	NELAP	1/24/2001
Silver	EPA 6010	Metals	NELAP	9/2/2005
Silver	EPA 6020	Metals	NELAP	9/2/2005
Silvex (2,4,5-TP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Sodium	EPA 200.7	Metals	NELAP	1/24/2001
Sodium	EPA 6010	Metals	NELAP	9/2/2005
Strontium	EPA 200.7	Metals	NELAP	9/2/2005
Strontium	EPA 6010	Metals	NELAP	7/24/2008
Styrene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Styrene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Sulfate	ASTM D516-02	General Chemistry	NELAP	7/24/2008

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Sulfate	ASTM D516-90	General Chemistry	NELAP	7/24/2008
Sulfate	EPA 300.0	General Chemistry	NELAP	5/19/2003
Sulfate	EPA 9038	General Chemistry	NELAP	9/2/2005
Sulfate	EPA 9056	General Chemistry	NELAP	9/2/2005
Sulfide	SM 4500-S D/UV-VIS	General Chemistry	NELAP	5/19/2003
Sulfide	SM 4500-S F	General Chemistry	NELAP	9/2/2005
Sulfite-SO3	SM 4500-SO3 B	General Chemistry	NELAP	5/19/2003
Sulfotepp	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Surfactants - MBAS	SM 5540 C	General Chemistry	NELAP	5/19/2003
tert-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	7/24/2008
tert-Butylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
tert-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Tetrachloroethylene (Perchloroethylene)	EPA 601	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 624	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Tetrachloroethylene (Perchloroethylene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Thallium	EPA 200.7	Metals	NELAP	1/24/2001
Thallium	EPA 200.8	Metals	NELAP	1/24/2001
Thallium	EPA 6010	Metals	NELAP	9/2/2005
Thallium	EPA 6020	Metals	NELAP	9/2/2005
Thionazin (Zinophos)	EPA 8270	Extractable Organics	NELAP	7/24/2008
Tin	EPA 200.7	Metals	NELAP	9/2/2005
Tin	EPA 6010	Metals	NELAP	9/2/2005
Tin	EPA 6020	Metals	NELAP	9/2/2005
Tin (limited CWA use only per EPA ATP)	EPA 200.8	Metals	NELAP	7/24/2008
Titanium	EPA 200.7	Metals	NELAP	9/2/2005
Titanium	EPA 6010	Metals	NELAP	9/2/2005
Toluene	EPA 602	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 624	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Toluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Total cyanide	EPA 9014	General Chemistry	NELAP	7/24/2008
Total cyanide	SM 4500CN-E	General Chemistry	NELAP	9/2/2005
Total nitrate-nitrite	EPA 300.0	General Chemistry	NELAP	5/19/2003
Total nitrate-nitrite	EPA 9056	General Chemistry	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Total nitrate-nitrite	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Total organic carbon	SM 5310C	General Chemistry	NELAP	7/24/2008
Total Petroleum Hydrocarbons (TPH)	EPA 1664A	General Chemistry	NELAP	7/24/2008
Total phenolics	EPA 420.1	General Chemistry	NELAP	7/24/2008
Toxaphene (Chlorinated camphene)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Toxaphene (Chlorinated camphene)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
trans-1,2-Dichloroethylene	EPA 601	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 624	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
trans-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	9/2/2005
trans-1,3-Dichloropropylene	EPA 601	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 624	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
trans-1,3-Dichloropropylene	EPA 8260	Volatile Organics	NELAP	9/2/2005
trans-1,4-Dichloro-2-butene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Trichloroethene (Trichloroethylene)	EPA 601	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 624	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Trichloroethene (Trichloroethylene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Trichlorofluoromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Trichlorofluoromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Turbidity	SM 2130 B	General Chemistry	NELAP	9/2/2005
Uranium	EPA 200.8	Metals	NELAP	7/24/2008
Uranium	EPA 6020	Metals	NELAP	7/24/2008
Vanadium	EPA 200.7	Metals	NELAP	1/24/2001
Vanadium	EPA 200.8	Metals	NELAP	1/24/2001
Vanadium	EPA 6010	Metals	NELAP	9/2/2005
Vanadium	EPA 6020	Metals	NELAP	9/2/2005
Vinyl acetate	EPA 8260	Volatile Organics	NELAP	7/24/2008
Vinyl chloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Vinyl chloride	EPA 8260	Volatile Organics	NELAP	9/2/2005
Xylene (total)	EPA 602	Volatile Organics	NELAP	5/19/2003

Laboratory Scope of Accreditation

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Xylene (total)	EPA 624	Volatile Organics	NELAP	5/19/2003
Xylene (total)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Xylene (total)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Zinc	EPA 200.7	Metals	NELAP	1/24/2001
Zinc	EPA 200.8	Metals	NELAP	1/24/2001
Zinc	EPA 6010	Metals	NELAP	9/2/2005
Zinc	EPA 6020	Metals	NELAP	9/2/2005

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,1,1,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	5/19/2003
1,1,1-Trichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,1,2,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	5/19/2003
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,2-Trichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloropropene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,3-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,3-Trichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,4,5-Tetrachlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,2,4-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2,4-Trimethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2,4-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Diphenylhydrazine	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3,5-Trimethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,3,5-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330	Extractable Organics	NELAP	1/24/2001

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,3-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330	Extractable Organics	NELAP	1/24/2001
1,3-Tolualdehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,4-Naphthoquinone	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,4-Phenylenediamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
1-Chlorohexane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1-Methylnaphthalene (added to method at FDEP request)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1-Naphthylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
2,3,4,6-Tetrachlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4,5-T	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4,5-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4,6-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2,4-D	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-DB	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
2,4-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4-Dimethylphenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4-Dinitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2,6-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330	Extractable Organics	NELAP	5/19/2003
2-Acetylaminofluorene	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8021	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8260	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
2-Chloronaphthalene	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Chlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Hexanone	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Methyl-4,6-dinitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Methylnaphthalene	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Methylphenol (o-Cresol)	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Naphthylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Nitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
2-Picoline (2-Methylpyridine)	EPA 8270	Extractable Organics	NELAP	1/24/2001
3,3'-Dichlorobenzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
3,3'-Dimethylbenzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Methylcholanthrene	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Methylphenol (m-Cresol)	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
4,4'-DDD	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDE	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
4,4'-DDT	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330	Extractable Organics	NELAP	1/24/2001
4-Aminobiphenyl	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Bromophenyl phenyl ether	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Chloro-3-methylphenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Chloroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Chlorophenyl phenylether	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
4-Dimethyl aminoazobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Methyl-2-pentanone (MIBK)	EPA 8260	Volatile Organics	NELAP	1/24/2001
4-Methylphenol (p-Cresol)	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Nitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
5-Nitro-o-toluidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
7,12-Dimethylbenz(a) anthracene	EPA 8270	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
a-a-Dimethylphenethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acenaphthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Acenaphthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Acenaphthylene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acenaphthylene	EPA 8310	Extractable Organics	NELAP	1/24/2001
Acetaldehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
Acetone	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acetonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acetophenone	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acrolein (Propenal)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acrylonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Aldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Allyl chloride (3-Chloropropene)	EPA 8260	Volatile Organics	NELAP	7/24/2008
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
alpha-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Aluminum	EPA 6010	Metals	NELAP	1/24/2001
Aniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8310	Extractable Organics	NELAP	1/24/2001
Antimony	EPA 6010	Metals	NELAP	1/24/2001
Antimony	EPA 6020	Metals	NELAP	1/24/2001
Aramite	EPA 8270	Extractable Organics	NELAP	1/24/2001
Aroclor-1016 (PCB-1016)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1221 (PCB-1221)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1232 (PCB-1232)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1242 (PCB-1242)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1248 (PCB-1248)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1254 (PCB-1254)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1260 (PCB-1260)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Arsenic	EPA 6010	Metals	NELAP	1/24/2001
Arsenic	EPA 6020	Metals	NELAP	1/24/2001
Barium	EPA 6010	Metals	NELAP	1/24/2001
Barium	EPA 6020	Metals	NELAP	1/24/2001
Benzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Benzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Benzo(a)anthracene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(a)anthracene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(a)pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(a)pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(b)fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(b)fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(g,h,i)perylene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(g,h,i)perylene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(k)fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(k)fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzoic acid	EPA 8270	Extractable Organics	NELAP	1/24/2001
Benzyl alcohol	EPA 8270	Extractable Organics	NELAP	1/24/2001
Beryllium	EPA 6010	Metals	NELAP	1/24/2001
Beryllium	EPA 6020	Metals	NELAP	1/24/2001
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
bis(2-Chloroethoxy)methane	EPA 8270	Extractable Organics	NELAP	5/19/2003
bis(2-Chloroethyl) ether	EPA 8270	Extractable Organics	NELAP	5/19/2003
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 8270	Extractable Organics	NELAP	7/24/2008
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Boron	EPA 6010	Metals	NELAP	1/24/2001
Bromobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromochloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8021	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8260	Volatile Organics	NELAP	1/24/2001
Butanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Butyl benzyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Cadmium	EPA 6010	Metals	NELAP	1/24/2001
Cadmium	EPA 6020	Metals	NELAP	1/24/2001
Calcium	EPA 6010	Metals	NELAP	1/24/2001
Carbazole	EPA 8270	Extractable Organics	NELAP	5/19/2003
Carbon disulfide	EPA 8260	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8260	Volatile Organics	NELAP	1/24/2001

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chlordane (tech.)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Chloride	EPA 9056	General Chemistry	NELAP	5/19/2003
Chlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chlorobenzilate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chlorobenzilate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chloroprene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chromium	EPA 6010	Metals	NELAP	1/24/2001
Chromium	EPA 6020	Metals	NELAP	1/24/2001
Chromium VI	EPA 7196	General Chemistry	NELAP	5/19/2003
Chrysene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Chrysene	EPA 8310	Extractable Organics	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8021	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Cobalt	EPA 6010	Metals	NELAP	1/24/2001
Cobalt	EPA 6020	Metals	NELAP	1/24/2001
Copper	EPA 6010	Metals	NELAP	1/24/2001
Copper	EPA 6020	Metals	NELAP	1/24/2001
Crotonaldehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
Cyclohexanone	EPA 8315	Extractable Organics	NELAP	1/24/2001
Dalapon	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Decanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
delta-BHC	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Diallate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diallate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dibenz(a,h)anthracene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Dibenz(a,h)anthracene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Dibenzofuran	EPA 8270	Extractable Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Dibromomethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dibromomethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dicamba	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Dichlorodifluoromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dichloroprop (Dichlorprop)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dieldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diesel range organics (DRO)	EPA 8015	Extractable Organics	NELAP	5/19/2003
Diethyl ether	EPA 8260	Volatile Organics	NELAP	1/24/2001
Diethyl phthalate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Di-isopropylether (DIPE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dimethoate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dimethyl phthalate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Di-n-butyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Di-n-octyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diphenylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Endosulfan I	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endosulfan II	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endosulfan sulfate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin aldehyde	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endrin ketone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Ethanol	EPA 8015	Volatile Organics	NELAP	1/24/2001
Ethanol	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl acetate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl methacrylate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Famphur	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Fluorene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Fluorene	EPA 8310	Extractable Organics	NELAP	5/19/2003

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Fluoride	EPA 9056	General Chemistry	NELAP	5/19/2003
Formaldehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
gamma-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Gasoline range organics (GRO)	EPA 8015	Extractable Organics	NELAP	5/19/2003
Heptachlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor epoxide	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Hexachlorobenzene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachlorobutadiene	EPA 8260	Volatile Organics	NELAP	5/19/2003
Hexachlorobutadiene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachlorocyclopentadiene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Hexachloroethane	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachloropropene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Hexanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Ignitability	EPA 1020	General Chemistry	NELAP	1/24/2001
Indeno(1,2,3-cd)pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Indeno(1,2,3-cd)pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Iodomethane (Methyl iodide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Iron	EPA 6010	Metals	NELAP	1/24/2001
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8015	Volatile Organics	NELAP	1/24/2001
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isodrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Isodrin	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Isophorone	EPA 8270	Extractable Organics	NELAP	5/19/2003
Isopropyl alcohol (2-Propanol)	EPA 8015	Volatile Organics	NELAP	1/24/2001
Isopropyl alcohol (2-Propanol)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isopropylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isosafrole	EPA 8270	Extractable Organics	NELAP	1/24/2001
Kepone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Kepone	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Lead	EPA 6010	Metals	NELAP	1/24/2001
Lead	EPA 6020	Metals	NELAP	1/24/2001
Lithium	EPA 6010	Metals	NELAP	1/24/2001
m+p-Xylenes	EPA 8260	Volatile Organics	NELAP	9/9/2005

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Analyte	Method/Tech	Category	Certification Type	Effective Date
Magnesium	EPA 6010	Metals	NELAP	1/24/2001
Manganese	EPA 6010	Metals	NELAP	1/24/2001
Manganese	EPA 6020	Metals	NELAP	1/24/2001
MCPA	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
MCPP	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Mercury	EPA 7471	Metals	NELAP	1/24/2001
Methacrylonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methanol	EPA 8015	Volatile Organics	NELAP	1/24/2001
Methapyrilene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Methoxychlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl methacrylate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Methyl parathion (Parathion, methyl)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methyl tert-butyl ether (MTBE)	EPA 8021	Volatile Organics	NELAP	5/19/2003
Methyl tert-butyl ether (MTBE)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Molybdenum	EPA 6010	Metals	NELAP	1/24/2001
Molybdenum	EPA 6020	Metals	NELAP	7/24/2008
Naphthalene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Naphthalene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Naphthalene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Naphthalene	EPA 8310	Extractable Organics	NELAP	1/24/2001
n-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	1/24/2001
n-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	1/24/2001
n-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
n-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Nickel	EPA 6010	Metals	NELAP	1/24/2001
Nickel	EPA 6020	Metals	NELAP	1/24/2001
Nitrate	EPA 9056	General Chemistry	NELAP	5/19/2003
Nitrite	EPA 9056	General Chemistry	NELAP	5/19/2003
Nitrobenzene	EPA 8270	Extractable Organics	NELAP	5/19/2003

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Analyte	Method/Tech	Category	Certification Type	Effective Date
Nitrobenzene	EPA 8330	Extractable Organics	NELAP	7/24/2008
Nitroquinoline-1-oxide	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodiethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodimethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitroso-di-n-butylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodi-n-propylamine	EPA 8270	Extractable Organics	NELAP	5/19/2003
n-Nitrosodiphenylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosomethylethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosomorpholine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosopiperidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosopyrrolidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Nonanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
n-Propanol	EPA 8260	Volatile Organics	NELAP	7/24/2008
n-Propylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
o,o,o-Triethyl phosphorothioate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Octanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Oil & Grease	EPA 9071	General Chemistry	NELAP	1/24/2001
o-Toluidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
o-Xylene	EPA 8260	Volatile Organics	NELAP	9/9/2005
Paint Filter Liquids Test	EPA 9095	General Chemistry	NELAP	1/24/2001
Paraldehyde	EPA 8015	Volatile Organics	NELAP	1/24/2001
Parathion, ethyl	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
p-Dioxane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Pentachlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentachloronitrobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentachlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentanal (Valeraldehyde)	EPA 8315	Extractable Organics	NELAP	1/24/2001
pH	EPA 9045	General Chemistry	NELAP	1/24/2001
Phenacetin	EPA 8270	Extractable Organics	NELAP	1/24/2001
Phenanthrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Phenanthrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Phenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
Phorate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
p-Isopropyltoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Potassium	EPA 6010	Metals	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-12, expiration date June 30, 2010. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Pronamide (Kerb)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Propanal (Propionaldehyde)	EPA 8315	Extractable Organics	NELAP	1/24/2001
Propionitrile (Ethyl cyanide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Pyridine	EPA 8270	Extractable Organics	NELAP	1/24/2001
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Safrole	EPA 8270	Extractable Organics	NELAP	1/24/2001
sec-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
sec-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Selenium	EPA 6010	Metals	NELAP	1/24/2001
Selenium	EPA 6020	Metals	NELAP	7/24/2008
Silicon	EPA 6010	Metals	NELAP	1/24/2001
Silver	EPA 6010	Metals	NELAP	1/24/2001
Silver	EPA 6020	Metals	NELAP	1/24/2001
Silvex (2,4,5-TP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Sodium	EPA 6010	Metals	NELAP	1/24/2001
Strontium	EPA 6010	Metals	NELAP	1/24/2001
Styrene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Styrene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Sulfate	EPA 9038	General Chemistry	NELAP	7/24/2008
Sulfate	EPA 9056	General Chemistry	NELAP	5/19/2003
Sulfide	EPA 9030/9034	General Chemistry	NELAP	1/24/2001
Sulfotepp	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Synthetic Precipitation Leaching Procedure	EPA 1312	General Chemistry	NELAP	1/24/2001
tert-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	1/24/2001
tert-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	1/24/2001
tert-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
tert-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Thallium	EPA 6010	Metals	NELAP	1/24/2001
Thallium	EPA 6020	Metals	NELAP	1/24/2001
Thionazin (Zinophos)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Tin	EPA 6010	Metals	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Tin	EPA 6020	Metals	NELAP	7/24/2008
Titanium	EPA 6010	Metals	NELAP	5/19/2003
Toluene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Total cyanide	EPA 9014	General Chemistry	NELAP	9/2/2005
Total nitrate-nitrite	EPA 9056	General Chemistry	NELAP	5/19/2003
Total organic carbon	WALKLEY-BLACK	General Chemistry	NELAP	9/2/2005
Total organic halides (TOX)	EPA 9020	General Chemistry	NELAP	1/24/2001
Total phenolics	EPA 9065	General Chemistry	NELAP	7/24/2008
Toxaphene (Chlorinated camphene)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Toxicity Characteristic Leaching Procedure	EPA 1311	General Chemistry	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
trans-1,4-Dichloro-2-butene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trifluralin (Treflan)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Vanadium	EPA 6010	Metals	NELAP	1/24/2001
Vanadium	EPA 6020	Metals	NELAP	7/24/2008
Vinyl acetate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Xylene (total)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Xylene (total)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Zinc	EPA 6010	Metals	NELAP	1/24/2001
Zinc	EPA 6020	Metals	NELAP	1/24/2001

NELAP RECOGNIZED
ACCREDITING
nelap
AUTHORITY

FLORIDA DEPARTMENT OF
HEALTH

State of Florida

Department of Health, Bureau of Laboratories

This is to certify that

E87622

TRIMATRIX LABORATORIES, INC.
5560 CORPORATE EXCHANGE COURT SE
GRAND RAPIDS, MI 49512

has complied with Florida Administrative Code 64E-1,
for the examination of Environmental samples in the following categories

DRINKING WATER - GROUP II UNREGULATED CONTAMINANTS, DRINKING WATER - OTHER REGULATED CONTAMINANTS, DRINKING WATER - PRIMARY INORGANIC CONTAMINANTS, DRINKING WATER - SECONDARY INORGANIC CONTAMINANTS, NON-POTABLE WATER - EXTRACTABLE ORGANICS, NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - METALS, NON-POTABLE WATER - PESTICIDES-HERBICIDES-PCB'S, NON-POTABLE WATER - VOLATILE ORGANICS, SOLID AND CHEMICAL MATERIALS - EXTRACTABLE ORGANICS, SOLID AND CHEMICAL MATERIALS - GENERAL CHEMISTRY, SOLID AND CHEMICAL MATERIALS - METALS, SOLID AND CHEMICAL MATERIALS - PESTICIDES-HERBICIDES-PCB'S, SOLID AND CHEMICAL MATERIALS - VOLATILE ORGANICS

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

EFFECTIVE July 01, 2010 THROUGH June 30, 2011

GREAT SEAL OF THE STATE OF FLORIDA
IN GOD WE TRUST

Max Salfinger, M.D.
Chief, Bureau of Laboratories
Florida Department of Health
DH Form 1697, 7/04
NON-TRANSFERABLE E87622-13-07/01/2010
Supersedes all previously issued certificates

Charlie Crist
Governor

FLORIDA DEPARTMENT OF HEALTH

Ana M. Viamonte Ros. M.D., M.P.H.
State Surgeon General

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1,1-Trichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1,2,2-Tetrachloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1,2-Trichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1-Dichloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1-Dichloropropene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,3-Trichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,3-Trichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,4-Trichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,4-Trimethylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2-Dichlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,2-Dichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,2-Dichloropropane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,3,5-Trimethylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,3-Dichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,3-Dichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,4-Dichlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
2,2-Dichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
2-Chlorotoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
4-Chlorotoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
4-Isopropyltoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Alkalinity as CaCO3	SM 2320 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Aluminum	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Antimony	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Arsenic	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Barium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Benzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Beryllium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Bromobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromochloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromodichloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromoform	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Cadmium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Calcium	EPA 200.7	Primary Inorganic Contaminants	NELAP	1/24/2001
Carbon tetrachloride	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chloride	EPA 300.0	Secondary Inorganic Contaminants	NELAP	5/19/2003
Chlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Chloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Chloroform	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Chromium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
cis-1,3-Dichloropropene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Color	SM 2120 B	Secondary Inorganic Contaminants	NELAP	7/24/2008
Conductivity	SM 2510 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Copper	EPA 200.7	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	NELAP	1/24/2001
Copper	EPA 200.8	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	NELAP	1/24/2001
Cyanide	SM 4500-CN E	Primary Inorganic Contaminants	NELAP	7/24/2008
Dibromochloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dibromomethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dichlorodifluoromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dichloromethane (DCM, Methylene chloride)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Ethylbenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Fluoride	SM 4500 F-C	Primary Inorganic Contaminants	NELAP	5/19/2003
Hardness	SM 2340 B	Secondary Inorganic Contaminants	NELAP	7/24/2008
Hardness	SM 2340 C	Secondary Inorganic Contaminants	NELAP	7/24/2008
Hexachlorobutadiene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Iron	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Isopropylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Lead	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Manganese	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Manganese	EPA 200.8	Secondary Inorganic Contaminants	NELAP	1/24/2001
Mercury	EPA 245.1	Primary Inorganic Contaminants	NELAP	5/19/2003
Methyl bromide (Bromomethane)	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Methyl chloride (Chloromethane)	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Naphthalene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Nickel	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Nitrate as N	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
Nitrate as N	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Nitrite	SM 4500-NO2 B	Primary Inorganic Contaminants	NELAP	5/19/2003

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Nitrite	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Nitrite as N	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
n-Propylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Orthophosphate as P	SM 4500-P E	Primary Inorganic Contaminants	NELAP	7/24/2008
pH	SM 4500-H B	Primary Inorganic Contaminants	NELAP	5/19/2003
Residue-filterable (TDS)	SM 2540 C	Secondary Inorganic Contaminants	NELAP	9/9/2005
Selenium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Silver	EPA 200.8	Secondary Inorganic Contaminants	NELAP	1/24/2001
Sodium	EPA 200.7	Primary Inorganic Contaminants	NELAP	1/24/2001
Styrene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Sulfate	EPA 300.0	Secondary Inorganic Contaminants	NELAP	5/19/2003
Tetrachloroethylene (Perchloroethylene)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Thallium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Toluene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Total nitrate-nitrite	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
Total nitrate-nitrite	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Total organic carbon	SM 5310 C	Primary Inorganic Contaminants	NELAP	7/24/2008
Total trihalomethanes	EPA 524.2	Other Regulated Contaminants	NELAP	7/24/2008
trans-1,2-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
trans-1,3-Dichloropropylene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Trichloroethene (Trichloroethylene)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Trichlorofluoromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Turbidity	SM 2130 B	Secondary Inorganic Contaminants	NELAP	5/19/2003
Vinyl chloride	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Xylene (total)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Zinc	EPA 200.7	Secondary Inorganic Contaminants	NELAP	4/20/2001
Zinc	EPA 200.8	Secondary Inorganic Contaminants	NELAP	4/20/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1,1,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,1-Trichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,1-Trichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1,2,2-Tetrachloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,2,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,2-Trichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,2-Trichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1-Dichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethylene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1-Dichloropropene	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1-Dichloropropene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,3-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2,3-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,3-Trichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2,3-Trichloropropane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2,4,5-Tetrachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,2,4-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8021	Volatile Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,2-Dichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Dichloropropane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Diphenylhydrazine	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330	Extractable Organics	NELAP	7/24/2008
1,3-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,3-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,3-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3-Dichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,3-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330	Extractable Organics	NELAP	7/24/2008
1,3-Tolualdehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
1,4-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,4-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,4-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,4-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,4-Dioxane (1,4-Diethyleneoxide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,4-Naphthoquinone	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,4-Phenylenediamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
1-Chlorohexane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1-Methylnaphthalene (added to method at FDEP request)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1-Naphthylamine	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
2,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
2,3,4,6-Tetrachlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,5-T	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4,5-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,6-Trichlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4,6-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2,4-D	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-DB	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-Dichlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dimethylphenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dimethylphenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dinitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dinitrotoluene (2,4-DNT)	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270	Extractable Organics	NELAP	9/2/2005
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2,6-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,6-Dinitrotoluene (2,6-DNT)	EPA 625	Extractable Organics	NELAP	1/24/2001
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270	Extractable Organics	NELAP	9/2/2005
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Acetylaminofluorene	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330	Extractable Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Chloroethyl vinyl ether	EPA 601	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 624	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8021	Volatile Organics	NELAP	7/24/2008
2-Chloroethyl vinyl ether	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Chloronaphthalene	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Chloronaphthalene	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Chlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Chlorophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Chlorotoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
2-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
2-Hexanone	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Methyl-4,6-dinitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Methyl-4,6-dinitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Methylnaphthalene	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Methylphenol (o-Cresol)	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Naphthylamine	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Nitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Nitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Nitropropane	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Picoline (2-Methylpyridine)	EPA 8270	Extractable Organics	NELAP	9/2/2005
3,3'-Dichlorobenzidine	EPA 625	Extractable Organics	NELAP	1/24/2001
3,3'-Dichlorobenzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
3,3'-Dimethylbenzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Methylcholanthrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Methylphenol (m-Cresol)	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
3-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
4,4'-DDD	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDD	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4,4'-DDE	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDE	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4,4'-DDT	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDT	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330	Extractable Organics	NELAP	7/24/2008
4-Aminobiphenyl	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Bromophenyl phenyl ether	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Bromophenyl phenyl ether	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chloro-3-methylphenol	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Chloro-3-methylphenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chloroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Chlorophenyl phenylether	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Chlorophenyl phenylether	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chlorotoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
4-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
4-Dimethyl aminoazobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Methyl-2-pentanone (MIBK)	EPA 8260	Volatile Organics	NELAP	7/24/2008
4-Methylphenol (p-Cresol)	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Nitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Nitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
5-Nitro-o-toluidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
7,12-Dimethylbenz(a) anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
a-a-Dimethylphenethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Acenaphthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Acenaphthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Acenaphthylene	EPA 610	Extractable Organics	NELAP	7/24/2008
Acenaphthylene	EPA 625	Extractable Organics	NELAP	1/24/2001
Acenaphthylene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthylene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Acetaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
Acetone	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acetonitrile	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acetophenone	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acrolein (Propenal)	EPA 624	Volatile Organics	NELAP	5/19/2003
Acrolein (Propenal)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acrylonitrile	EPA 624	Volatile Organics	NELAP	5/19/2003

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Acrylonitrile	EPA 8260	Volatile Organics	NELAP	9/2/2005
Aldrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Alkalinity as CaCO3	SM 2320 B	General Chemistry	NELAP	9/2/2005
Allyl chloride (3-Chloropropene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
alpha-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Aluminum	EPA 200.7	Metals	NELAP	1/24/2001
Aluminum	EPA 6010	Metals	NELAP	9/2/2005
Amenable cyanide	SM 4500 CN-G	General Chemistry	NELAP	5/19/2003
Ammonia as N	SM 4500-NH3 G	General Chemistry	NELAP	5/19/2003
Aniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
Anthracene	EPA 610	Extractable Organics	NELAP	7/24/2008
Anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Antimony	EPA 200.7	Metals	NELAP	1/24/2001
Antimony	EPA 200.8	Metals	NELAP	1/24/2001
Antimony	EPA 6010	Metals	NELAP	9/2/2005
Antimony	EPA 6020	Metals	NELAP	9/2/2005
Aramite	EPA 8270	Extractable Organics	NELAP	9/2/2005
Aroclor-1016 (PCB-1016)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1016 (PCB-1016)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1221 (PCB-1221)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1221 (PCB-1221)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Aroclor-1232 (PCB-1232)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1232 (PCB-1232)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1242 (PCB-1242)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1242 (PCB-1242)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1248 (PCB-1248)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1248 (PCB-1248)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1254 (PCB-1254)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1254 (PCB-1254)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1260 (PCB-1260)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1260 (PCB-1260)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Arsenic	EPA 200.7	Metals	NELAP	1/24/2001
Arsenic	EPA 200.8	Metals	NELAP	1/24/2001
Arsenic	EPA 6010	Metals	NELAP	9/2/2005
Arsenic	EPA 6020	Metals	NELAP	9/2/2005
Available cyanide	OIA 1677	General Chemistry	NELAP	9/9/2005
Barium	EPA 200.7	Metals	NELAP	1/24/2001
Barium	EPA 200.8	Metals	NELAP	1/24/2001
Barium	EPA 6010	Metals	NELAP	9/2/2005
Barium	EPA 6020	Metals	NELAP	9/2/2005
Benzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Benzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Benzidine	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)anthracene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(a)anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(a)anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(a)pyrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(a)pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(a)pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(b)fluoranthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(b)fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(b)fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(b)fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(g,h,i)perylene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(g,h,i)perylene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(g,h,i)perylene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(g,h,i)perylene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(k)fluoranthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Benzo(k)fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(k)fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(k)fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzoic acid	EPA 8270	Extractable Organics	NELAP	7/24/2008

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Benzyl alcohol	EPA 8270	Extractable Organics	NELAP	7/24/2008
Beryllium	EPA 200.7	Metals	NELAP	1/24/2001
Beryllium	EPA 200.8	Metals	NELAP	1/24/2001
Beryllium	EPA 6010	Metals	NELAP	9/2/2005
Beryllium	EPA 6020	Metals	NELAP	9/2/2005
beta-BHC (beta-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Biochemical oxygen demand	SM 5210 B	General Chemistry	NELAP	5/19/2003
bis(2-Chloroethoxy)methane	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Chloroethoxy)methane	EPA 8270	Extractable Organics	NELAP	9/2/2005
bis(2-Chloroethyl) ether	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Chloroethyl) ether	EPA 8270	Extractable Organics	NELAP	9/2/2005
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 625	Extractable Organics	NELAP	7/24/2008
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 8270	Extractable Organics	NELAP	7/24/2008
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Boron	EPA 200.7	Metals	NELAP	1/24/2001
Boron	EPA 6010	Metals	NELAP	9/2/2005
Bromobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromochloromethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromochloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromodichloromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Bromodichloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromoform	EPA 601	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 624	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8021	Volatile Organics	NELAP	9/2/2005
Bromoform	EPA 8260	Volatile Organics	NELAP	9/2/2005
Butanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Butyl benzyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Butyl benzyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Cadmium	EPA 200.7	Metals	NELAP	1/24/2001
Cadmium	EPA 200.8	Metals	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Cadmium	EPA 6010	Metals	NELAP	9/2/2005
Cadmium	EPA 6020	Metals	NELAP	9/2/2005
Calcium	EPA 200.7	Metals	NELAP	1/24/2001
Calcium	EPA 6010	Metals	NELAP	9/2/2005
Carbazole	EPA 8270	Extractable Organics	NELAP	7/24/2008
Carbon disulfide	EPA 8260	Volatile Organics	NELAP	7/24/2008
Carbon tetrachloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Carbon tetrachloride	EPA 8260	Volatile Organics	NELAP	9/2/2005
Carbonaceous BOD (CBOD)	SM 5210 B	General Chemistry	NELAP	5/19/2003
Chemical oxygen demand	SM 5220 D	General Chemistry	NELAP	5/19/2003
Chlordane (tech.)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chlordane (tech.)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Chloride	EPA 300.0	General Chemistry	NELAP	5/19/2003
Chloride	EPA 9056	General Chemistry	NELAP	9/2/2005
Chloride	SM 4500-Cl E	General Chemistry	NELAP	5/19/2003
Chlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chlorobenzilate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Chloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chloroform	EPA 601	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 624	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chloroform	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chloroprene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chromium	EPA 200.7	Metals	NELAP	1/24/2005
Chromium	EPA 200.8	Metals	NELAP	1/24/2001
Chromium	EPA 6010	Metals	NELAP	9/2/2005
Chromium	EPA 6020	Metals	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chromium VI	EPA 7196	General Chemistry	NELAP	7/24/2008
Chromium VI	SM 3500-Cr B (20th/21st Ed.)/UV-VIS	General Chemistry	NELAP	9/2/2005
Chrysene	EPA 610	Extractable Organics	NELAP	7/24/2008
Chrysene	EPA 625	Extractable Organics	NELAP	1/24/2001
Chrysene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Chrysene	EPA 8310	Extractable Organics	NELAP	7/24/2008
cis-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	7/24/2008
cis-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
cis-1,3-Dichloropropene	EPA 601	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 624	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8021	Volatile Organics	NELAP	7/24/2008
cis-1,3-Dichloropropene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Cobalt	EPA 200.7	Metals	NELAP	1/24/2001
Cobalt	EPA 200.8	Metals	NELAP	1/24/2001
Cobalt	EPA 6010	Metals	NELAP	9/2/2005
Cobalt	EPA 6020	Metals	NELAP	9/2/2005
Color	SM 2120 B	General Chemistry	NELAP	7/24/2008
Conductivity	SM 2510 B	General Chemistry	NELAP	9/2/2005
Copper	EPA 200.7	Metals	NELAP	1/24/2001
Copper	EPA 200.8	Metals	NELAP	1/24/2001
Copper	EPA 6010	Metals	NELAP	9/2/2005
Copper	EPA 6020	Metals	NELAP	9/2/2005
Crotonaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
Cyclohexanone	EPA 8315	Extractable Organics	NELAP	7/24/2008
Dalapon	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Decanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
delta-BHC	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
delta-BHC	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Diallate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Dibenz(a,h)anthracene	EPA 610	Extractable Organics	NELAP	7/24/2008
Dibenz(a,h)anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Dibenz(a,h)anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Dibenz(a,h)anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Dibenzofuran	EPA 8270	Extractable Organics	NELAP	7/24/2008
Dibromochloromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 624	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Dibromochloromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Dibromochloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Dibromomethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dibromomethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dicamba	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Dichlorodifluoromethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Dichloroprop (Dichlorprop)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dieldrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dieldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Diesel range organics (DRO)	EPA 8015	Extractable Organics	NELAP	7/24/2008
Diethyl ether	EPA 8260	Volatile Organics	NELAP	7/24/2008
Diethyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Diethyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-isopropylether (DIPE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dimethoate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Dimethyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Dimethyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-n-butyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Di-n-butyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-n-octyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Di-n-octyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270	Extractable Organics	NELAP	7/24/2008
Disulfoton	EPA 8270	Extractable Organics	NELAP	7/24/2008
Endosulfan I	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan I	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endosulfan II	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan II	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endosulfan sulfate	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan sulfate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin aldehyde	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin aldehyde	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Endrin ketone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Ethane	RSK-175	Volatile Organics	NELAP	9/2/2005
Ethanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
Ethanol	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl acetate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl methacrylate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Ethylbenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Ethylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethylene	RSK-175	Volatile Organics	NELAP	9/2/2005
Famphur	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Fluoranthene	EPA 610	Extractable Organics	NELAP	7/24/2008
Fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Fluorene	EPA 610	Extractable Organics	NELAP	7/24/2008
Fluorene	EPA 625	Extractable Organics	NELAP	1/24/2001
Fluorene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Fluorene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Fluoride	EPA 300.0	General Chemistry	NELAP	5/19/2003
Fluoride	EPA 9056	General Chemistry	NELAP	9/2/2005
Fluoride	SM 4500 F-C	General Chemistry	NELAP	5/19/2003
Formaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
gamma-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Gasoline range organics (GRO)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Hardness	SM 2340 B	General Chemistry	NELAP	7/24/2008
Hardness	SM 2340 C	General Chemistry	NELAP	5/19/2003
Heptachlor	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Heptachlor epoxide	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor epoxide	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Heptanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Hexachlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachlorobutadiene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorobutadiene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Hexachlorobutadiene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachlorocyclopentadiene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorocyclopentadiene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachloroethane	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Hexachloroethane	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachloropropene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Indeno(1,2,3-cd)pyrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Indeno(1,2,3-cd)pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Indeno(1,2,3-cd)pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Indeno(1,2,3-cd)pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Iodomethane (Methyl iodide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Iron	EPA 200.7	Metals	NELAP	1/24/2001
Iron	EPA 6010	Metals	NELAP	9/2/2005
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Isodrin	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Isophorone	EPA 625	Extractable Organics	NELAP	1/24/2001
Isophorone	EPA 8270	Extractable Organics	NELAP	9/2/2005
Isopropyl alcohol (2-Propanol)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Isopropyl alcohol (2-Propanol)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Isopropylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Isosafrole	EPA 8270	Extractable Organics	NELAP	9/2/2005
Kepone	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Kjeldahl nitrogen - total	EPA 351.2	General Chemistry	NELAP	1/24/2001
Lead	EPA 200.7	Metals	NELAP	1/24/2001
Lead	EPA 200.8	Metals	NELAP	1/24/2001
Lead	EPA 6010	Metals	NELAP	9/2/2005
Lead	EPA 6020	Metals	NELAP	9/2/2005
Lithium	EPA 200.7	Metals	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Lithium	EPA 6010	Metals	NELAP	9/2/2005
m+p-Xylenes	EPA 8260	Volatile Organics	NELAP	7/24/2008
Magnesium	EPA 200.7	Metals	NELAP	1/24/2001
Magnesium	EPA 6010	Metals	NELAP	9/2/2005
Manganese	EPA 200.7	Metals	NELAP	1/24/2001
Manganese	EPA 200.8	Metals	NELAP	1/24/2001
Manganese	EPA 6010	Metals	NELAP	9/2/2005
Manganese	EPA 6020	Metals	NELAP	9/2/2005
MCPA	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
MCPP	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Mercury	EPA 1631	Metals	NELAP	9/9/2005
Mercury	EPA 245.1	Metals	NELAP	5/19/2003
Mercury	EPA 7470	Metals	NELAP	7/24/2008
Methacrylonitrile	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methane	RSK-175	Volatile Organics	NELAP	9/2/2005
Methanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
Methapyrilene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Methoxychlor	EPA 608.2	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methoxychlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Methyl bromide (Bromomethane)	EPA 601	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 624	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methyl bromide (Bromomethane)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl chloride (Chloromethane)	EPA 601	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 624	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methyl chloride (Chloromethane)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl methacrylate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Methyl parathion (Parathion, methyl)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Methyl tert-butyl ether (MTBE)	EPA 8021	Volatile Organics	NELAP	7/24/2008
Methyl tert-butyl ether (MTBE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Methylene chloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methylene chloride	EPA 8260	Volatile Organics	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Molybdenum	EPA 200.7	Metals	NELAP	1/24/2001
Molybdenum	EPA 200.8	Metals	NELAP	1/24/2001
Molybdenum	EPA 6010	Metals	NELAP	9/2/2005
Molybdenum	EPA 6020	Metals	NELAP	9/2/2005
Naphthalene	EPA 610	Extractable Organics	NELAP	7/24/2008
Naphthalene	EPA 625	Extractable Organics	NELAP	1/24/2001
Naphthalene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Naphthalene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Naphthalene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Naphthalene	EPA 8310	Extractable Organics	NELAP	7/24/2008
n-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	7/24/2008
n-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	9/2/2005
n-Butylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
n-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Nickel	EPA 200.7	Metals	NELAP	1/24/2001
Nickel	EPA 200.8	Metals	NELAP	1/24/2001
Nickel	EPA 6010	Metals	NELAP	9/2/2005
Nickel	EPA 6020	Metals	NELAP	9/2/2005
Nitrate	EPA 9056	General Chemistry	NELAP	9/2/2005
Nitrate as N	EPA 300.0	General Chemistry	NELAP	5/19/2003
Nitrate as N	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Nitrite	EPA 9056	General Chemistry	NELAP	9/2/2005
Nitrite	SM 4500-NO2 B	General Chemistry	NELAP	5/19/2003
Nitrite	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Nitrite as N	EPA 300.0	General Chemistry	NELAP	5/19/2003
Nitrobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
Nitrobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Nitrobenzene	EPA 8330	Extractable Organics	NELAP	7/24/2008
Nitroquinoline-1-oxide	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodiethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodimethylamine	EPA 625	Extractable Organics	NELAP	1/24/2001
n-Nitrosodimethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitroso-di-n-butylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodi-n-propylamine	EPA 625	Extractable Organics	NELAP	1/24/2001
n-Nitrosodi-n-propylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodiphenylamine	EPA 625	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
n-Nitrosodiphenylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosomethylethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosomorpholine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosopiperidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosopyrrolidine	EPA 8270	Extractable Organics	NELAP	7/24/2008
Nonanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
n-Propanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
n-Propanol	EPA 8260	Volatile Organics	NELAP	7/24/2008
n-Propylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
o,o,o-Triethyl phosphorothioate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Octanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Oil & Grease	EPA 1664A	General Chemistry	NELAP	1/24/2001
Oil & Grease	EPA 9070	General Chemistry	NELAP	9/2/2005
Orthophosphate as P	SM 4500-P E	General Chemistry	NELAP	9/2/2005
o-Toluidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
o-Xylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Parathion, ethyl	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Pentachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentachloronitrobenzene (Quintozene)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentachlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
Pentachlorophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentanal (Valeraldehyde)	EPA 8315	Extractable Organics	NELAP	7/24/2008
pH	EPA 9040	General Chemistry	NELAP	7/24/2008
pH	SM 4500-H B	General Chemistry	NELAP	5/19/2003
Phenacetin	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phenanthrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Phenanthrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Phenanthrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phenanthrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Phenol	EPA 625	Extractable Organics	NELAP	1/24/2001
Phenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phorate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phosphorus, total	SM 4500-P F	General Chemistry	NELAP	7/24/2008
p-Isopropyltoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
p-Isopropyltoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Potassium	EPA 200.7	Metals	NELAP	1/24/2001
Potassium	EPA 6010	Metals	NELAP	9/2/2005
Pronamide (Kerb)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Propanal (Propionaldehyde)	EPA 8315	Extractable Organics	NELAP	7/24/2008
Propionitrile (Ethyl cyanide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Pyrene	EPA 610	Extractable Organics	NELAP	7/24/2008
Pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Pyridine	EPA 8270	Extractable Organics	NELAP	7/24/2008
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Residue-filterable (TDS)	SM 2540 C	General Chemistry	NELAP	9/2/2005
Residue-nonfilterable (TSS)	SM 2540 D	General Chemistry	NELAP	9/2/2005
Residue-settleable	SM 2540 F	General Chemistry	NELAP	7/24/2008
Residue-total	SM 2540 B	General Chemistry	NELAP	9/2/2005
Residue-volatile	EPA 160.4	General Chemistry	NELAP	1/24/2001
Safrole	EPA 8270	Extractable Organics	NELAP	9/2/2005
sec-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Selenium	EPA 200.7	Metals	NELAP	1/24/2001
Selenium	EPA 200.8	Metals	NELAP	1/24/2001
Selenium	EPA 6010	Metals	NELAP	9/2/2005
Selenium	EPA 6020	Metals	NELAP	9/2/2005
Silicon	EPA 200.7	Metals	NELAP	1/24/2001
Silicon	EPA 6010	Metals	NELAP	9/2/2005
Silver	EPA 200.7	Metals	NELAP	1/24/2001
Silver	EPA 200.8	Metals	NELAP	1/24/2001
Silver	EPA 6010	Metals	NELAP	9/2/2005
Silver	EPA 6020	Metals	NELAP	9/2/2005
Silvex (2,4,5-TP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Sodium	EPA 200.7	Metals	NELAP	1/24/2001
Sodium	EPA 6010	Metals	NELAP	9/2/2005
Strontium	EPA 200.7	Metals	NELAP	9/2/2005
Strontium	EPA 6010	Metals	NELAP	7/24/2008
Styrene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Styrene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Sulfate	ASTM D516-02	General Chemistry	NELAP	7/24/2008

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Sulfate	ASTM D516-90	General Chemistry	NELAP	7/24/2008
Sulfate	EPA 300.0	General Chemistry	NELAP	5/19/2003
Sulfate	EPA 9038	General Chemistry	NELAP	9/2/2005
Sulfate	EPA 9056	General Chemistry	NELAP	9/2/2005
Sulfide	SM 4500-S D/UV-VIS	General Chemistry	NELAP	5/19/2003
Sulfide	SM 4500-S F	General Chemistry	NELAP	9/2/2005
Sulfite-SO3	SM 4500-SO3 B	General Chemistry	NELAP	5/19/2003
Sulfotepp	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Surfactants - MBAS	SM 5540 C	General Chemistry	NELAP	5/19/2003
tert-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	7/24/2008
tert-Butylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
tert-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Tetrachloroethylene (Perchloroethylene)	EPA 601	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 624	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Tetrachloroethylene (Perchloroethylene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Thallium	EPA 200.7	Metals	NELAP	1/24/2001
Thallium	EPA 200.8	Metals	NELAP	1/24/2001
Thallium	EPA 6010	Metals	NELAP	9/2/2005
Thallium	EPA 6020	Metals	NELAP	9/2/2005
Thionazin (Zinophos)	EPA 8270	Extractable Organics	NELAP	7/24/2008
Tin	EPA 200.7	Metals	NELAP	9/2/2005
Tin	EPA 6010	Metals	NELAP	9/2/2005
Tin	EPA 6020	Metals	NELAP	9/2/2005
Tin (limited CWA use only per EPA ATP)	EPA 200.8	Metals	NELAP	7/24/2008
Titanium	EPA 200.7	Metals	NELAP	9/2/2005
Titanium	EPA 6010	Metals	NELAP	9/2/2005
Toluene	EPA 602	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 624	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Toluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Total cyanide	EPA 9014	General Chemistry	NELAP	7/24/2008
Total cyanide	SM 4500CN-E	General Chemistry	NELAP	9/2/2005
Total nitrate-nitrite	EPA 300.0	General Chemistry	NELAP	5/19/2003
Total nitrate-nitrite	EPA 9056	General Chemistry	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Total nitrate-nitrite	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Total organic carbon	SM 5310 C	General Chemistry	NELAP	7/24/2008
Total Petroleum Hydrocarbons (TPH)	EPA 1664A	General Chemistry	NELAP	7/24/2008
Total phenolics	EPA 420.1	General Chemistry	NELAP	7/24/2008
Toxaphene (Chlorinated camphene)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Toxaphene (Chlorinated camphene)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
trans-1,2-Dichloroethylene	EPA 601	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 624	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
trans-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	9/2/2005
trans-1,3-Dichloropropylene	EPA 601	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 624	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
trans-1,3-Dichloropropylene	EPA 8260	Volatile Organics	NELAP	9/2/2005
trans-1,4-Dichloro-2-butene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Trichloroethene (Trichloroethylene)	EPA 601	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 624	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Trichloroethene (Trichloroethylene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Trichlorofluoromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Trichlorofluoromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Turbidity	SM 2130 B	General Chemistry	NELAP	9/2/2005
Uranium	EPA 200.8	Metals	NELAP	7/24/2008
Uranium	EPA 6020	Metals	NELAP	7/24/2008
Vanadium	EPA 200.7	Metals	NELAP	1/24/2001
Vanadium	EPA 200.8	Metals	NELAP	1/24/2001
Vanadium	EPA 6010	Metals	NELAP	9/2/2005
Vanadium	EPA 6020	Metals	NELAP	9/2/2005
Vinyl acetate	EPA 8260	Volatile Organics	NELAP	7/24/2008
Vinyl chloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Vinyl chloride	EPA 8260	Volatile Organics	NELAP	9/2/2005
Xylene (total)	EPA 602	Volatile Organics	NELAP	5/19/2003

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Xylene (total)	EPA 624	Volatile Organics	NELAP	5/19/2003
Xylene (total)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Xylene (total)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Zinc	EPA 200.7	Metals	NELAP	1/24/2001
Zinc	EPA 200.8	Metals	NELAP	1/24/2001
Zinc	EPA 6010	Metals	NELAP	9/2/2005
Zinc	EPA 6020	Metals	NELAP	9/2/2005

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,1,1,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	5/19/2003
1,1,1-Trichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,1,2,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	5/19/2003
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,2-Trichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloropropene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,3-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,3-Trichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,4,5-Tetrachlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,2,4-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2,4-Trimethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2,4-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Diphenylhydrazine	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3,5-Trimethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,3,5-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,3-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330	Extractable Organics	NELAP	1/24/2001
1,3-Tolualdehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,4-Naphthoquinone	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,4-Phenylenediamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
1-Chlorohexane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1-Methylnaphthalene (added to method at FDEP request)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1-Naphthylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
2,3,4,6-Tetrachlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4,5-T	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4,5-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4,6-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2,4-D	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-DB	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
2,4-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4-Dimethylphenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4-Dinitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2,6-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330	Extractable Organics	NELAP	5/19/2003
2-Acetylaminofluorene	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8021	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8260	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
2-Chloronaphthalene	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Chlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Hexanone	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Methyl-4,6-dinitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Methylnaphthalene	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Methylphenol (o-Cresol)	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Naphthylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Nitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
2-Picoline (2-Methylpyridine)	EPA 8270	Extractable Organics	NELAP	1/24/2001
3,3'-Dichlorobenzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
3,3'-Dimethylbenzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Methylcholanthrene	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Methylphenol (m-Cresol)	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
4,4'-DDD	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDE	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
4,4'-DDT	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330	Extractable Organics	NELAP	1/24/2001
4-Aminobiphenyl	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Bromophenyl phenyl ether	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Chloro-3-methylphenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Chloroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Chlorophenyl phenylether	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
4-Dimethyl aminoazobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Methyl-2-pentanone (MIBK)	EPA 8260	Volatile Organics	NELAP	1/24/2001
4-Methylphenol (p-Cresol)	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Nitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
5-Nitro-o-toluidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
7,12-Dimethylbenz(a) anthracene	EPA 8270	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
a-a-Dimethylphenethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acenaphthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Acenaphthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Acenaphthylene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acenaphthylene	EPA 8310	Extractable Organics	NELAP	1/24/2001
Acetaldehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
Acetone	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acetonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acetophenone	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acrolein (Propenal)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acrylonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Aldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Allyl chloride (3-Chloropropene)	EPA 8260	Volatile Organics	NELAP	7/24/2008
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
alpha-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Aluminum	EPA 6010	Metals	NELAP	1/24/2001
Aniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8310	Extractable Organics	NELAP	1/24/2001
Antimony	EPA 6010	Metals	NELAP	1/24/2001
Antimony	EPA 6020	Metals	NELAP	1/24/2001
Aramite	EPA 8270	Extractable Organics	NELAP	1/24/2001
Aroclor-1016 (PCB-1016)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1221 (PCB-1221)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1232 (PCB-1232)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1242 (PCB-1242)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1248 (PCB-1248)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1254 (PCB-1254)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1260 (PCB-1260)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Arsenic	EPA 6010	Metals	NELAP	1/24/2001
Arsenic	EPA 6020	Metals	NELAP	1/24/2001
Barium	EPA 6010	Metals	NELAP	1/24/2001
Barium	EPA 6020	Metals	NELAP	1/24/2001
Benzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Benzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Benzo(a)anthracene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(a)anthracene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(a)pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(a)pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(b)fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(b)fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(g,h,i)perylene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(g,h,i)perylene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(k)fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(k)fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzoic acid	EPA 8270	Extractable Organics	NELAP	1/24/2001
Benzyl alcohol	EPA 8270	Extractable Organics	NELAP	1/24/2001
Beryllium	EPA 6010	Metals	NELAP	1/24/2001
Beryllium	EPA 6020	Metals	NELAP	1/24/2001
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
bis(2-Chloroethoxy)methane	EPA 8270	Extractable Organics	NELAP	5/19/2003
bis(2-Chloroethyl) ether	EPA 8270	Extractable Organics	NELAP	5/19/2003
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 8270	Extractable Organics	NELAP	7/24/2008
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Boron	EPA 6010	Metals	NELAP	1/24/2001
Bromobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromochloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8021	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8260	Volatile Organics	NELAP	1/24/2001
Butanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Butyl benzyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Cadmium	EPA 6010	Metals	NELAP	1/24/2001
Cadmium	EPA 6020	Metals	NELAP	1/24/2001
Calcium	EPA 6010	Metals	NELAP	1/24/2001
Carbazole	EPA 8270	Extractable Organics	NELAP	5/19/2003
Carbon disulfide	EPA 8260	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8260	Volatile Organics	NELAP	1/24/2001

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chlordane (tech.)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Chloride	EPA 9056	General Chemistry	NELAP	5/19/2003
Chlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chlorobenzilate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chlorobenzilate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chloroprene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chromium	EPA 6010	Metals	NELAP	1/24/2001
Chromium	EPA 6020	Metals	NELAP	1/24/2001
Chromium VI	EPA 7196	General Chemistry	NELAP	5/19/2003
Chrysene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Chrysene	EPA 8310	Extractable Organics	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8021	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Cobalt	EPA 6010	Metals	NELAP	1/24/2001
Cobalt	EPA 6020	Metals	NELAP	1/24/2001
Copper	EPA 6010	Metals	NELAP	1/24/2001
Copper	EPA 6020	Metals	NELAP	1/24/2001
Crotonaldehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
Cyclohexanone	EPA 8315	Extractable Organics	NELAP	1/24/2001
Dalapon	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Decanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
delta-BHC	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Diallate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diallate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dibenz(a,h)anthracene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Dibenz(a,h)anthracene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Dibenzofuran	EPA 8270	Extractable Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Dibromomethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dibromomethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dicamba	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Dichlorodifluoromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dichloroprop (Dichlorprop)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dieldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diesel range organics (DRO)	EPA 8015	Extractable Organics	NELAP	5/19/2003
Diethyl ether	EPA 8260	Volatile Organics	NELAP	1/24/2001
Diethyl phthalate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Di-isopropylether (DIPE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dimethoate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dimethyl phthalate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Di-n-butyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Di-n-octyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diphenylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Endosulfan I	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endosulfan II	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endosulfan sulfate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin aldehyde	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endrin ketone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Ethanol	EPA 8015	Volatile Organics	NELAP	1/24/2001
Ethanol	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl acetate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl methacrylate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Famphur	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Fluorene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Fluorene	EPA 8310	Extractable Organics	NELAP	5/19/2003

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Fluoride	EPA 9056	General Chemistry	NELAP	5/19/2003
Formaldehyde	EPA 8315	Extractable Organics	NELAP	1/24/2001
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
gamma-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Gasoline range organics (GRO)	EPA 8015	Extractable Organics	NELAP	5/19/2003
Heptachlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor epoxide	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Hexachlorobenzene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachlorobutadiene	EPA 8260	Volatile Organics	NELAP	5/19/2003
Hexachlorobutadiene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachlorocyclopentadiene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Hexachloroethane	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachloropropene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Hexanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Ignitability	EPA 1020	General Chemistry	NELAP	1/24/2001
Indeno(1,2,3-cd)pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Indeno(1,2,3-cd)pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Iodomethane (Methyl iodide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Iron	EPA 6010	Metals	NELAP	1/24/2001
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8015	Volatile Organics	NELAP	1/24/2001
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isodrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Isodrin	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Isophorone	EPA 8270	Extractable Organics	NELAP	5/19/2003
Isopropyl alcohol (2-Propanol)	EPA 8015	Volatile Organics	NELAP	1/24/2001
Isopropyl alcohol (2-Propanol)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isopropylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isosafrole	EPA 8270	Extractable Organics	NELAP	1/24/2001
Kepone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Kepone	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Lead	EPA 6010	Metals	NELAP	1/24/2001
Lead	EPA 6020	Metals	NELAP	1/24/2001
Lithium	EPA 6010	Metals	NELAP	1/24/2001
m+p-Xylenes	EPA 8260	Volatile Organics	NELAP	9/9/2005

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Magnesium	EPA 6010	Metals	NELAP	1/24/2001
Manganese	EPA 6010	Metals	NELAP	1/24/2001
Manganese	EPA 6020	Metals	NELAP	1/24/2001
MCPA	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
MCPP	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Mercury	EPA 7471	Metals	NELAP	1/24/2001
Methacrylonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methanol	EPA 8015	Volatile Organics	NELAP	1/24/2001
Methapyrilene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Methoxychlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl methacrylate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Methyl parathion (Parathion, methyl)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methyl tert-butyl ether (MTBE)	EPA 8021	Volatile Organics	NELAP	5/19/2003
Methyl tert-butyl ether (MTBE)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Molybdenum	EPA 6010	Metals	NELAP	1/24/2001
Molybdenum	EPA 6020	Metals	NELAP	7/24/2008
Naphthalene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Naphthalene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Naphthalene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Naphthalene	EPA 8310	Extractable Organics	NELAP	1/24/2001
n-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	1/24/2001
n-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	1/24/2001
n-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
n-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Nickel	EPA 6010	Metals	NELAP	1/24/2001
Nickel	EPA 6020	Metals	NELAP	1/24/2001
Nitrate	EPA 9056	General Chemistry	NELAP	5/19/2003
Nitrite	EPA 9056	General Chemistry	NELAP	5/19/2003
Nitrobenzene	EPA 8270	Extractable Organics	NELAP	5/19/2003

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Analyte	Method/Tech	Category	Certification Type	Effective Date
Nitrobenzene	EPA 8330	Extractable Organics	NELAP	7/24/2008
Nitroquinoline-1-oxide	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodiethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodimethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitroso-di-n-butylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodi-n-propylamine	EPA 8270	Extractable Organics	NELAP	5/19/2003
n-Nitrosodiphenylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosomethylethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosomorpholine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosopiperidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosopyrrolidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Nonanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
n-Propanol	EPA 8260	Volatile Organics	NELAP	7/24/2008
n-Propylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
o,o,o-Triethyl phosphorothioate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Octanal	EPA 8315	Extractable Organics	NELAP	1/24/2001
Oil & Grease	EPA 9071	General Chemistry	NELAP	1/24/2001
o-Toluidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
o-Xylene	EPA 8260	Volatile Organics	NELAP	9/9/2005
Paint Filter Liquids Test	EPA 9095	General Chemistry	NELAP	1/24/2001
Paraldehyde	EPA 8015	Volatile Organics	NELAP	1/24/2001
Parathion, ethyl	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
p-Dioxane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Pentachlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentachloronitrobenzene (Quintozene)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentachlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentanal (Valeraldehyde)	EPA 8315	Extractable Organics	NELAP	1/24/2001
pH	EPA 9045	General Chemistry	NELAP	1/24/2001
Phenacetin	EPA 8270	Extractable Organics	NELAP	1/24/2001
Phenanthrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Phenanthrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Phenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
Phorate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
p-Isopropyltoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Potassium	EPA 6010	Metals	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Pronamide (Kerb)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Propanal (Propionaldehyde)	EPA 8315	Extractable Organics	NELAP	1/24/2001
Propionitrile (Ethyl cyanide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Pyridine	EPA 8270	Extractable Organics	NELAP	1/24/2001
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Safrole	EPA 8270	Extractable Organics	NELAP	1/24/2001
sec-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
sec-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Selenium	EPA 6010	Metals	NELAP	1/24/2001
Selenium	EPA 6020	Metals	NELAP	7/24/2008
Silicon	EPA 6010	Metals	NELAP	1/24/2001
Silver	EPA 6010	Metals	NELAP	1/24/2001
Silver	EPA 6020	Metals	NELAP	1/24/2001
Silvex (2,4,5-TP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Sodium	EPA 6010	Metals	NELAP	1/24/2001
Strontium	EPA 6010	Metals	NELAP	1/24/2001
Styrene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Styrene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Sulfate	EPA 9038	General Chemistry	NELAP	7/24/2008
Sulfate	EPA 9056	General Chemistry	NELAP	5/19/2003
Sulfide	EPA 9030/9034	General Chemistry	NELAP	1/24/2001
Sulfotepp	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Synthetic Precipitation Leaching Procedure	EPA 1312	General Chemistry	NELAP	1/24/2001
tert-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	1/24/2001
tert-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	1/24/2001
tert-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
tert-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Thallium	EPA 6010	Metals	NELAP	1/24/2001
Thallium	EPA 6020	Metals	NELAP	1/24/2001
Thionazin (Zinophos)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Tin	EPA 6010	Metals	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-13, expiration date June 30, 2011. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Tin	EPA 6020	Metals	NELAP	7/24/2008
Titanium	EPA 6010	Metals	NELAP	5/19/2003
Toluene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Total cyanide	EPA 9014	General Chemistry	NELAP	9/2/2005
Total nitrate-nitrite	EPA 9056	General Chemistry	NELAP	5/19/2003
Total organic carbon	WALKLEY-BLACK	General Chemistry	NELAP	9/2/2005
Total organic halides (TOX)	EPA 9020	General Chemistry	NELAP	1/24/2001
Total phenolics	EPA 9065	General Chemistry	NELAP	7/24/2008
Toxaphene (Chlorinated camphene)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Toxicity Characteristic Leaching Procedure	EPA 1311	General Chemistry	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
trans-1,4-Dichloro-2-butene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trifluralin (Treflan)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Vanadium	EPA 6010	Metals	NELAP	1/24/2001
Vanadium	EPA 6020	Metals	NELAP	7/24/2008
Vinyl acetate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Xylene (total)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Xylene (total)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Zinc	EPA 6010	Metals	NELAP	1/24/2001
Zinc	EPA 6020	Metals	NELAP	1/24/2001

FLORIDA DEPARTMENT OF HEALTH

State of Florida

Department of Health, Bureau of Laboratories

This is to certify that

E87622

TRIMATRIX LABORATORIES, INC.
5560 CORPORATE EXCHANGE COURT SE
GRAND RAPIDS, MI 49512

has complied with Florida Administrative Code 64E-1,
for the examination of Environmental samples in the following categories

DRINKING WATER - GROUP II UNREGULATED CONTAMINANTS, DRINKING WATER - OTHER REGULATED CONTAMINANTS, DRINKING WATER - PRIMARY INORGANIC CONTAMINANTS, DRINKING WATER - SECONDARY INORGANIC CONTAMINANTS, NON-POTABLE WATER - EXTRACTABLE ORGANICS, NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - METALS, NON-POTABLE WATER - PESTICIDES-HERBICIDES-PCB'S, NON-POTABLE WATER - VOLATILE ORGANICS, SOLID AND CHEMICAL MATERIALS - EXTRACTABLE ORGANICS, SOLID AND CHEMICAL MATERIALS - GENERAL CHEMISTRY, SOLID AND CHEMICAL MATERIALS - METALS, SOLID AND CHEMICAL MATERIALS - PESTICIDES-HERBICIDES-PCB'S, SOLID AND CHEMICAL MATERIALS - VOLATILE ORGANICS

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

Date Issued: July 01, 2011 Expiration Date: June 30, 2012

Max Salfinger, M.D.
Chief, Bureau of Laboratories
Florida Department of Health
DH Form 1697, 7/04
NON-TRANSFERABLE E87622-21-07/01/2011
Supersedes all previously issued certificates

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1,1-Trichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1,2,2-Tetrachloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1,2-Trichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1-Dichloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,1-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,1-Dichloropropene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,3-Trichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,3-Trichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,4-Trichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2,4-Trimethylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,2-Dichlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,2-Dichloroethane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,2-Dichloropropane	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
1,3,5-Trimethylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,3-Dichlorobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,3-Dichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
1,4-Dichlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
2,2-Dichloropropane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
2-Chlorotoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
4-Chlorotoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
4-Isopropyltoluene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Alkalinity as CaCO3	SM 2320 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Aluminum	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Antimony	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Arsenic	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Barium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Benzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Beryllium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Bromobenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromochloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromodichloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Bromoform	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Cadmium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Calcium	EPA 200.7	Primary Inorganic Contaminants	NELAP	1/24/2001
Carbon tetrachloride	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chloride	EPA 300.0	Secondary Inorganic Contaminants	NELAP	5/19/2003
Chlorobenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Chloroethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Chloroform	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Chromium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
cis-1,3-Dichloropropene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Color	SM 2120 B	Secondary Inorganic Contaminants	NELAP	7/24/2008
Conductivity	SM 2510 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Copper	EPA 200.8	Primary Inorganic Contaminants,Secondary Inorganic Contaminants	NELAP	1/24/2001
Cyanide	SM 4500-CN E	Primary Inorganic Contaminants	NELAP	7/24/2008
Dibromochloromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dibromomethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dichlorodifluoromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Dichloromethane (DCM, Methylene chloride)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Ethylbenzene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Fluoride	EPA 300.0	Secondary Inorganic Contaminants	NELAP	4/28/2011
Fluoride	SM 4500 F-C	Primary Inorganic Contaminants	NELAP	5/19/2003
Hardness	SM 2340 B	Secondary Inorganic Contaminants	NELAP	7/24/2008
Hardness	SM 2340 C	Secondary Inorganic Contaminants	NELAP	7/24/2008
Hexachlorobutadiene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Iron	EPA 200.7	Secondary Inorganic Contaminants	NELAP	1/24/2001
Isopropylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Lead	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Manganese	EPA 200.8	Secondary Inorganic Contaminants	NELAP	1/24/2001
Mercury	EPA 245.1	Primary Inorganic Contaminants	NELAP	5/19/2003
Methyl bromide (Bromomethane)	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Methyl chloride (Chloromethane)	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Naphthalene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Nickel	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Nitrate as N	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003
Nitrate as N	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Nitrite	SM 4500-NO2 B	Primary Inorganic Contaminants	NELAP	5/19/2003
Nitrite	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Nitrite as N	EPA 300.0	Primary Inorganic Contaminants	NELAP	5/19/2003

Clients and Customers are urged to verify the laboratory's current certification status with the Environmental Laboratory Certification Program. **Issue Date: 7/1/2011** **Expiration Date: 6/30/2012**

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** M100005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Drinking Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
n-Propylbenzene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Orthophosphate as P	SM 4500-P E	Primary Inorganic Contaminants	NELAP	7/24/2008
pH	SM 4500-H B	Primary Inorganic Contaminants	NELAP	5/19/2003
Residue-filterable (TDS)	SM 2540 C	Secondary Inorganic Contaminants	NELAP	9/9/2005
Selenium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Silver	EPA 200.8	Secondary Inorganic Contaminants	NELAP	1/24/2001
Sodium	EPA 200.7	Primary Inorganic Contaminants	NELAP	1/24/2001
Styrene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Sulfate	EPA 300.0	Secondary Inorganic Contaminants	NELAP	5/19/2003
Tetrachloroethylene (Perchloroethylene)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Thallium	EPA 200.8	Primary Inorganic Contaminants	NELAP	1/24/2001
Toluene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Total nitrate-nitrite	SM 4500-NO3 F	Primary Inorganic Contaminants	NELAP	9/9/2005
Total organic carbon	SM 5310 C	Primary Inorganic Contaminants	NELAP	7/24/2008
Total trihalomethanes	EPA 524.2	Other Regulated Contaminants	NELAP	7/24/2008
trans-1,2-Dichloroethylene	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
trans-1,3-Dichloropropylene	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Trichloroethene (Trichloroethylene)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Trichlorofluoromethane	EPA 524.2	Group II Unregulated Contaminants	NELAP	5/19/2003
Turbidity	SM 2130 B	Secondary Inorganic Contaminants	NELAP	5/19/2003
Vinyl chloride	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Xylene (total)	EPA 524.2	Other Regulated Contaminants	NELAP	5/19/2003
Zinc	EPA 200.8	Secondary Inorganic Contaminants	NELAP	4/20/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1,1,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,1-Trichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,1-Trichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1,2,2-Tetrachloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,2,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,2-Trichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1,2-Trichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1-Dichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethylene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,1-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1-Dichloropropene	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,1-Dichloropropene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,3-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2,3-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,3-Trichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2,3-Trichloropropane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2,4,5-Tetrachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2,4-Trichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,2,4-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260	Volatile Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,2-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,2-Dichloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Dichloropropane	EPA 601	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 624	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,2-Diphenylhydrazine	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3,5-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270	Extractable Organics	NELAP	2/17/2011
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330	Extractable Organics	NELAP	7/24/2008
1,3-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,3-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,3-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,3-Dichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
1,3-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270	Extractable Organics	NELAP	2/17/2011
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330	Extractable Organics	NELAP	7/24/2008
1,3-Tolualdehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
1,4-Dichlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,4-Dichlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
1,4-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,4-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,4-Dioxane (1,4-Diethyleneoxide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
1,4-Naphthoquinone	EPA 8270	Extractable Organics	NELAP	7/24/2008
1,4-Phenylenediamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
1-Chlorohexane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1-Methylnaphthalene (added to method at FDEP request)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1-Naphthylamine	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	7/24/2008
2,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	9/2/2005
2,3,4,6-Tetrachlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,5-T	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4,5-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,6-Trichlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4,6-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2,4-D	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-DB	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-Dichlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dimethylphenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dimethylphenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dinitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,4-Dinitrotoluene (2,4-DNT)	EPA 625	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270	Extractable Organics	NELAP	9/2/2005
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2,6-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	7/24/2008
2,6-Dinitrotoluene (2,6-DNT)	EPA 625	Extractable Organics	NELAP	1/24/2001
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270	Extractable Organics	NELAP	9/2/2005
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Acetylaminofluorene	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260	Volatile Organics	NELAP	7/24/2008

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code: M100005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
2-Chloroethyl vinyl ether	EPA 601	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 624	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8021	Volatile Organics	NELAP	7/24/2008
2-Chloroethyl vinyl ether	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Chloronaphthalene	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Chloronaphthalene	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Chlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Chlorophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Chlorotoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
2-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
2-Hexanone	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Methyl-4,6-dinitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Methyl-4,6-dinitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Methylnaphthalene	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Methylphenol (o-Cresol)	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Naphthylamine	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
2-Nitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
2-Nitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
2-Nitropropane	EPA 8260	Volatile Organics	NELAP	7/24/2008
2-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
2-Picoline (2-Methylpyridine)	EPA 8270	Extractable Organics	NELAP	9/2/2005
3,3'-Dichlorobenzidine	EPA 625	Extractable Organics	NELAP	1/24/2001
3,3'-Dichlorobenzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
3,3'-Dimethylbenzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
3/4-Methylphenols (m/p-Cresols)	EPA 8270	Extractable Organics	NELAP	12/10/2010
3-Methylcholanthrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
3-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
3-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
4,4'-DDD	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDD	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4,4'-DDE	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDE	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4,4'-DDT	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDT	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330	Extractable Organics	NELAP	7/24/2008

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
4-Aminobiphenyl	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Bromophenyl phenyl ether	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Bromophenyl phenyl ether	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chloro-3-methylphenol	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Chloro-3-methylphenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chloroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Chlorophenyl phenylether	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Chlorophenyl phenylether	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Chlorotoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
4-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
4-Dimethyl aminoazobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Methyl-2-pentanone (MIBK)	EPA 8260	Volatile Organics	NELAP	7/24/2008
4-Nitroaniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
4-Nitrophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
4-Nitrophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
4-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	7/24/2008
5-Nitro-o-toluidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
7,12-Dimethylbenz(a) anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
a-a-Dimethylphenethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Acenaphthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Acenaphthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Acenaphthylene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Acenaphthylene	EPA 625	Extractable Organics	NELAP	1/24/2001
Acenaphthylene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acenaphthylene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Acetaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
Acetone	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acetonitrile	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acetophenone	EPA 8270	Extractable Organics	NELAP	9/2/2005
Acidity, as CaCO3	SM 2310 B (4a)	General Chemistry	NELAP	4/28/2011
Acrolein (Propenal)	EPA 624	Volatile Organics	NELAP	5/19/2003
Acrolein (Propenal)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Acrylonitrile	EPA 624	Volatile Organics	NELAP	5/19/2003
Acrylonitrile	EPA 8260	Volatile Organics	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Aldrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Alkalinity as CaCO3	SM 2320 B	General Chemistry	NELAP	9/2/2005
Allyl chloride (3-Chloropropene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
alpha-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Aluminum	EPA 200.7	Metals	NELAP	1/24/2001
Aluminum	EPA 6010	Metals	NELAP	9/2/2005
Amenable cyanide	SM 4500 CN-G	General Chemistry	NELAP	5/19/2003
Ammonia as N	SM 4500-NH3 G	General Chemistry	NELAP	5/19/2003
Aniline	EPA 8270	Extractable Organics	NELAP	7/24/2008
Anthracene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Antimony	EPA 200.8	Metals	NELAP	1/24/2001
Antimony	EPA 6020	Metals	NELAP	9/2/2005
Aramite	EPA 8270	Extractable Organics	NELAP	9/2/2005
Aroclor-1016 (PCB-1016)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1016 (PCB-1016)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1221 (PCB-1221)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1221 (PCB-1221)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Aroclor-1232 (PCB-1232)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1232 (PCB-1232)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1242 (PCB-1242)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1242 (PCB-1242)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1248 (PCB-1248)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1248 (PCB-1248)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1254 (PCB-1254)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1254 (PCB-1254)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Aroclor-1260 (PCB-1260)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1260 (PCB-1260)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Arsenic	EPA 200.7	Metals	NELAP	1/24/2001
Arsenic	EPA 200.8	Metals	NELAP	1/24/2001
Arsenic	EPA 6010	Metals	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Arsenic	EPA 6020	Metals	NELAP	9/2/2005
Available cyanide	OIA 1677	General Chemistry	NELAP	9/9/2005
Barium	EPA 200.7	Metals	NELAP	1/24/2001
Barium	EPA 200.8	Metals	NELAP	1/24/2001
Barium	EPA 6010	Metals	NELAP	9/2/2005
Barium	EPA 6020	Metals	NELAP	9/2/2005
Benzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Benzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Benzidine	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)anthracene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Benzo(a)anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(a)anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(a)pyrene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Benzo(a)pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(a)pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(a)pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(b)fluoranthene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Benzo(b)fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(b)fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(b)fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(g,h,i)perylene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Benzo(g,h,i)perylene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(g,h,i)perylene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(g,h,i)perylene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzo(k)fluoranthene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Benzo(k)fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Benzo(k)fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Benzo(k)fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Benzoic acid	EPA 8270	Extractable Organics	NELAP	7/24/2008
Benzyl alcohol	EPA 8270	Extractable Organics	NELAP	7/24/2008
Beryllium	EPA 200.7	Metals	NELAP	1/24/2001
Beryllium	EPA 200.8	Metals	NELAP	1/24/2001

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Beryllium	EPA 6010	Metals	NELAP	9/2/2005
Beryllium	EPA 6020	Metals	NELAP	9/2/2005
beta-BHC (beta-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Biochemical oxygen demand	SM 5210 B	General Chemistry	NELAP	5/19/2003
bis(2-Chloroethoxy)methane	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Chloroethoxy)methane	EPA 8270	Extractable Organics	NELAP	9/2/2005
bis(2-Chloroethyl) ether	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Chloroethyl) ether	EPA 8270	Extractable Organics	NELAP	9/2/2005
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 625	Extractable Organics	NELAP	7/24/2008
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 8270	Extractable Organics	NELAP	7/24/2008
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 625	Extractable Organics	NELAP	1/24/2001
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Boron	EPA 200.7	Metals	NELAP	1/24/2001
Boron	EPA 6010	Metals	NELAP	9/2/2005
Bromide	EPA 300.0	General Chemistry	NELAP	4/28/2011
Bromide	EPA 9056	General Chemistry	NELAP	4/28/2011
Bromobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromochloromethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromochloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromodichloromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Bromodichloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Bromoform	EPA 601	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 624	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8021	Volatile Organics	NELAP	9/2/2005
Bromoform	EPA 8260	Volatile Organics	NELAP	9/2/2005
Butanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Butyl benzyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Butyl benzyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Cadmium	EPA 200.7	Metals	NELAP	1/24/2001
Cadmium	EPA 200.8	Metals	NELAP	1/24/2001
Cadmium	EPA 6010	Metals	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Cadmium	EPA 6020	Metals	NELAP	9/2/2005
Calcium	EPA 200.7	Metals	NELAP	1/24/2001
Calcium	EPA 6010	Metals	NELAP	9/2/2005
Carbazole	EPA 8270	Extractable Organics	NELAP	7/24/2008
Carbon disulfide	EPA 8260	Volatile Organics	NELAP	7/24/2008
Carbon tetrachloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Carbon tetrachloride	EPA 8260	Volatile Organics	NELAP	9/2/2005
Carbonaceous BOD (CBOD)	SM 5210 B	General Chemistry	NELAP	5/19/2003
Chemical oxygen demand	SM 5220 D	General Chemistry	NELAP	5/19/2003
Chlordane (tech.)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chlordane (tech.)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Chloride	EPA 300.0	General Chemistry	NELAP	5/19/2003
Chloride	EPA 9056	General Chemistry	NELAP	9/2/2005
Chloride	SM 4500-Cl E	General Chemistry	NELAP	5/19/2003
Chlorobenzene	EPA 601	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chlorobenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chlorobenzilate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Chloroethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Chloroethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chloroethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chloroform	EPA 601	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 624	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8021	Volatile Organics	NELAP	9/2/2005
Chloroform	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chloroprene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Chromium	EPA 200.7	Metals	NELAP	1/24/2005
Chromium	EPA 200.8	Metals	NELAP	1/24/2001
Chromium	EPA 6010	Metals	NELAP	9/2/2005
Chromium	EPA 6020	Metals	NELAP	9/2/2005
Chromium VI	EPA 7196	General Chemistry	NELAP	7/24/2008

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Chromium VI	SM 3500-Cr B (20th/21st Ed.)/UV-VIS	General Chemistry	NELAP	9/2/2005
Chrysene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Chrysene	EPA 625	Extractable Organics	NELAP	1/24/2001
Chrysene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Chrysene	EPA 8310	Extractable Organics	NELAP	7/24/2008
cis-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	7/24/2008
cis-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
cis-1,3-Dichloropropene	EPA 601	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 624	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8021	Volatile Organics	NELAP	7/24/2008
cis-1,3-Dichloropropene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Cobalt	EPA 200.7	Metals	NELAP	1/24/2001
Cobalt	EPA 200.8	Metals	NELAP	1/24/2001
Cobalt	EPA 6010	Metals	NELAP	9/2/2005
Cobalt	EPA 6020	Metals	NELAP	9/2/2005
Color	SM 2120 B	General Chemistry	NELAP	7/24/2008
Conductivity	SM 2510 B	General Chemistry	NELAP	9/2/2005
Copper	EPA 200.7	Metals	NELAP	1/24/2001
Copper	EPA 200.8	Metals	NELAP	1/24/2001
Copper	EPA 6010	Metals	NELAP	9/2/2005
Copper	EPA 6020	Metals	NELAP	9/2/2005
Crotonaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
Cyclohexanone	EPA 8315	Extractable Organics	NELAP	7/24/2008
Dalapon	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Decanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
delta-BHC	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
delta-BHC	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Diallate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Dibenz(a,h)anthracene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Dibenz(a,h)anthracene	EPA 625	Extractable Organics	NELAP	1/24/2001
Dibenz(a,h)anthracene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Dibenz(a,h)anthracene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Dibenzofuran	EPA 8270	Extractable Organics	NELAP	7/24/2008
Dibromochloromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Dibromochloromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Dibromomethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dibromomethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dicamba	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Dichlorodifluoromethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Dichloroprop (Dichlorprop)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dieldrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dieldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Diesel range organics (DRO)	EPA 8015	Extractable Organics	NELAP	7/24/2008
Diethyl ether	EPA 8260	Volatile Organics	NELAP	7/24/2008
Diethyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Diethyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-isopropylether (DIPE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Dimethoate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Dimethyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Dimethyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-n-butyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Di-n-butyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Di-n-octyl phthalate	EPA 625	Extractable Organics	NELAP	1/24/2001
Di-n-octyl phthalate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270	Extractable Organics	NELAP	7/24/2008
Disulfoton	EPA 8270	Extractable Organics	NELAP	2/17/2011
Endosulfan I	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan I	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endosulfan II	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan II	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endosulfan sulfate	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan sulfate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin aldehyde	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin aldehyde	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Endrin ketone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008

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State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Ethane	RSK-175	Volatile Organics	NELAP	9/2/2005
Ethanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
Ethanol	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl acetate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl methacrylate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Ethylbenzene	EPA 602	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 624	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Ethylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Ethylene	RSK-175	Volatile Organics	NELAP	9/2/2005
Famphur	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Ferrous iron	SM 3500-Fe B (20th/21st Ed.)/UV-VIS	General Chemistry	NELAP	4/28/2011
Fluoranthene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Fluoranthene	EPA 625	Extractable Organics	NELAP	1/24/2001
Fluoranthene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Fluoranthene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Fluorene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Fluorene	EPA 625	Extractable Organics	NELAP	1/24/2001
Fluorene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Fluorene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Fluoride	EPA 300.0	General Chemistry	NELAP	5/19/2003
Fluoride	EPA 9056	General Chemistry	NELAP	9/2/2005
Fluoride	SM 4500 F-C	General Chemistry	NELAP	5/19/2003
Formaldehyde	EPA 8315	Extractable Organics	NELAP	7/24/2008
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
gamma-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Gasoline range organics (GRO)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Hardness	SM 2340 B	General Chemistry	NELAP	7/24/2008
Hardness	SM 2340 C	General Chemistry	NELAP	5/19/2003
Heptachlor	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Heptachlor epoxide	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor epoxide	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Heptanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Hexachlorobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachlorobutadiene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorobutadiene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Hexachlorobutadiene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachlorocyclopentadiene	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachlorocyclopentadiene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachloroethane	EPA 625	Extractable Organics	NELAP	1/24/2001
Hexachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
Hexachloroethane	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexachloropropene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Hexanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Indeno(1,2,3-cd)pyrene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Indeno(1,2,3-cd)pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Indeno(1,2,3-cd)pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Indeno(1,2,3-cd)pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Iodomethane (Methyl iodide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Iron	EPA 200.7	Metals	NELAP	1/24/2001
Iron	EPA 6010	Metals	NELAP	9/2/2005
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Isodrin	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Isophorone	EPA 625	Extractable Organics	NELAP	1/24/2001
Isophorone	EPA 8270	Extractable Organics	NELAP	9/2/2005
Isopropyl alcohol (2-Propanol)	EPA 8015	Volatile Organics	NELAP	7/24/2008
Isopropyl alcohol (2-Propanol)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Isopropylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Isosafrole	EPA 8270	Extractable Organics	NELAP	9/2/2005
Kepone	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Kjeldahl nitrogen - total	EPA 351.2	General Chemistry	NELAP	1/24/2001
Lead	EPA 200.7	Metals	NELAP	1/24/2001
Lead	EPA 200.8	Metals	NELAP	1/24/2001
Lead	EPA 6010	Metals	NELAP	9/2/2005
Lead	EPA 6020	Metals	NELAP	9/2/2005
Lithium	EPA 200.7	Metals	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Lithium	EPA 6010	Metals	NELAP	9/2/2005
m+p-Xylenes	EPA 8260	Volatile Organics	NELAP	7/24/2008
Magnesium	EPA 200.7	Metals	NELAP	1/24/2001
Magnesium	EPA 6010	Metals	NELAP	9/2/2005
Manganese	EPA 200.7	Metals	NELAP	1/24/2001
Manganese	EPA 200.8	Metals	NELAP	1/24/2001
Manganese	EPA 6010	Metals	NELAP	9/2/2005
Manganese	EPA 6020	Metals	NELAP	9/2/2005
MCPA	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
MCPP	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Mercury	EPA 1631	Metals	NELAP	9/9/2005
Mercury	EPA 245.1	Metals	NELAP	5/19/2003
Mercury	EPA 7470	Metals	NELAP	7/24/2008
Methacrylonitrile	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methane	RSK-175	Volatile Organics	NELAP	9/2/2005
Methanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
Methapyrilene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Methoxychlor	EPA 608.2	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methoxychlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Methyl bromide (Bromomethane)	EPA 601	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 624	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methyl bromide (Bromomethane)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl chloride (Chloromethane)	EPA 601	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 624	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methyl chloride (Chloromethane)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl methacrylate	EPA 8260	Volatile Organics	NELAP	9/2/2005
Methyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Methyl parathion (Parathion, methyl)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Methyl tert-butyl ether (MTBE)	EPA 8021	Volatile Organics	NELAP	7/24/2008
Methyl tert-butyl ether (MTBE)	EPA 8260	Volatile Organics	NELAP	7/24/2008
Methylene chloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Methylene chloride	EPA 8260	Volatile Organics	NELAP	9/2/2005

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E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Molybdenum	EPA 200.7	Metals	NELAP	1/24/2001
Molybdenum	EPA 200.8	Metals	NELAP	1/24/2001
Molybdenum	EPA 6010	Metals	NELAP	9/2/2005
Molybdenum	EPA 6020	Metals	NELAP	9/2/2005
Naphthalene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Naphthalene	EPA 625	Extractable Organics	NELAP	1/24/2001
Naphthalene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Naphthalene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Naphthalene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Naphthalene	EPA 8310	Extractable Organics	NELAP	7/24/2008
n-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	7/24/2008
n-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	9/2/2005
n-Butylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
n-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Nickel	EPA 200.7	Metals	NELAP	1/24/2001
Nickel	EPA 200.8	Metals	NELAP	1/24/2001
Nickel	EPA 6010	Metals	NELAP	9/2/2005
Nickel	EPA 6020	Metals	NELAP	9/2/2005
Nitrate	EPA 9056	General Chemistry	NELAP	9/2/2005
Nitrate as N	EPA 300.0	General Chemistry	NELAP	5/19/2003
Nitrate as N	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Nitrite	EPA 9056	General Chemistry	NELAP	9/2/2005
Nitrite	SM 4500-NO2 B	General Chemistry	NELAP	5/19/2003
Nitrite	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Nitrite as N	EPA 300.0	General Chemistry	NELAP	5/19/2003
Nitrobenzene	EPA 625	Extractable Organics	NELAP	1/24/2001
Nitrobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Nitrobenzene	EPA 8330	Extractable Organics	NELAP	7/24/2008
Nitroquinoline-1-oxide	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodiethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodimethylamine	EPA 625	Extractable Organics	NELAP	1/24/2001
n-Nitrosodimethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitroso-di-n-butylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodi-n-propylamine	EPA 625	Extractable Organics	NELAP	1/24/2001
n-Nitrosodi-n-propylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosodiphenylamine	EPA 625	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
n-Nitrosodiphenylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosomethylethylamine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosomorpholine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosopiperidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
n-Nitrosopyrrolidine	EPA 8270	Extractable Organics	NELAP	7/24/2008
Nonanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
n-Propanol	EPA 8015	Volatile Organics	NELAP	7/24/2008
n-Propanol	EPA 8260	Volatile Organics	NELAP	7/24/2008
n-Propylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
o,o,o-Triethyl phosphorothioate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Octanal	EPA 8315	Extractable Organics	NELAP	7/24/2008
Oil & Grease	EPA 1664A	General Chemistry	NELAP	1/24/2001
Oil & Grease	EPA 9070	General Chemistry	NELAP	9/2/2005
Orthophosphate as P	SM 4500-P E	General Chemistry	NELAP	9/2/2005
o-Toluidine	EPA 8270	Extractable Organics	NELAP	9/2/2005
o-Xylene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Parathion, ethyl	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	2/17/2011
Pentachlorobenzene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentachloronitrobenzene (Quintozene)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentachlorophenol	EPA 625	Extractable Organics	NELAP	1/24/2001
Pentachlorophenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pentanal (Valeraldehyde)	EPA 8315	Extractable Organics	NELAP	7/24/2008
pH	EPA 9040	General Chemistry	NELAP	7/24/2008
pH	SM 4500-H B	General Chemistry	NELAP	5/19/2003
Phenacetin	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phenanthrene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Phenanthrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Phenanthrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phenanthrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Phenol	EPA 625	Extractable Organics	NELAP	1/24/2001
Phenol	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phorate	EPA 8270	Extractable Organics	NELAP	9/2/2005
Phosphorus, total	SM 4500-P E	General Chemistry	NELAP	4/28/2011
p-Isopropyltoluene	EPA 8021	Volatile Organics	NELAP	7/24/2008
p-Isopropyltoluene	EPA 8260	Volatile Organics	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Potassium	EPA 200.7	Metals	NELAP	1/24/2001
Potassium	EPA 6010	Metals	NELAP	9/2/2005
Pronamide (Kerb)	EPA 8270	Extractable Organics	NELAP	9/2/2005
Propanal (Propionaldehyde)	EPA 8315	Extractable Organics	NELAP	7/24/2008
Propionitrile (Ethyl cyanide)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Pyrene	EPA 610/HPLC-UV	Extractable Organics	NELAP	7/24/2008
Pyrene	EPA 625	Extractable Organics	NELAP	1/24/2001
Pyrene	EPA 8270	Extractable Organics	NELAP	9/2/2005
Pyrene	EPA 8310	Extractable Organics	NELAP	7/24/2008
Pyridine	EPA 8270	Extractable Organics	NELAP	7/24/2008
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Residue-filterable (TDS)	SM 2540 C	General Chemistry	NELAP	9/2/2005
Residue-nonfilterable (TSS)	SM 2540 D	General Chemistry	NELAP	9/2/2005
Residue-settleable	SM 2540 F	General Chemistry	NELAP	7/24/2008
Residue-total	SM 2540 B	General Chemistry	NELAP	9/2/2005
Residue-volatile	EPA 160.4	General Chemistry	NELAP	1/24/2001
Safrole	EPA 8270	Extractable Organics	NELAP	9/2/2005
sec-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Selenium	EPA 200.7	Metals	NELAP	1/24/2001
Selenium	EPA 200.8	Metals	NELAP	1/24/2001
Selenium	EPA 6010	Metals	NELAP	9/2/2005
Selenium	EPA 6020	Metals	NELAP	9/2/2005
Silica-dissolved	SM 4500-SiO2 D (20th/21st Ed.)	General Chemistry	NELAP	4/28/2011
Silicon	EPA 200.7	Metals	NELAP	1/24/2001
Silicon	EPA 6010	Metals	NELAP	9/2/2005
Silver	EPA 200.7	Metals	NELAP	1/24/2001
Silver	EPA 200.8	Metals	NELAP	1/24/2001
Silver	EPA 6010	Metals	NELAP	9/2/2005
Silver	EPA 6020	Metals	NELAP	9/2/2005
Silvex (2,4,5-TP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Sodium	EPA 200.7	Metals	NELAP	1/24/2001
Sodium	EPA 6010	Metals	NELAP	9/2/2005
Strontium	EPA 200.7	Metals	NELAP	9/2/2005
Strontium	EPA 6010	Metals	NELAP	7/24/2008
Styrene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Sulfate	ASTM D516-02	General Chemistry	NELAP	7/24/2008

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: M100005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Sulfate	ASTM D516-90	General Chemistry	NELAP	7/24/2008
Sulfate	EPA 300.0	General Chemistry	NELAP	5/19/2003
Sulfate	EPA 9038	General Chemistry	NELAP	9/2/2005
Sulfate	EPA 9056	General Chemistry	NELAP	9/2/2005
Sulfide	SM 4500-S D/UV-VIS	General Chemistry	NELAP	5/19/2003
Sulfide	SM 4500-S F	General Chemistry	NELAP	9/2/2005
Sulfite-SO3	SM 4500-SO3 B	General Chemistry	NELAP	5/19/2003
Sulfotepp	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
Surfactants - MBAS	SM 5540 C	General Chemistry	NELAP	5/19/2003
tert-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	7/24/2008
tert-Butylbenzene	EPA 8021	Volatile Organics	NELAP	9/2/2005
tert-Butylbenzene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Tetrachloroethylene (Perchloroethylene)	EPA 601	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 624	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Tetrachloroethylene (Perchloroethylene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	Extractable Organics	NELAP	7/24/2008
Thallium	EPA 200.7	Metals	NELAP	1/24/2001
Thallium	EPA 200.8	Metals	NELAP	1/24/2001
Thallium	EPA 6010	Metals	NELAP	9/2/2005
Thallium	EPA 6020	Metals	NELAP	9/2/2005
Thionazin (Zinophos)	EPA 8270	Extractable Organics	NELAP	7/24/2008
Tin	EPA 200.7	Metals	NELAP	9/2/2005
Tin	EPA 6010	Metals	NELAP	9/2/2005
Tin	EPA 6020	Metals	NELAP	9/2/2005
Tin (limited CWA use only per EPA ATP)	EPA 200.8	Metals	NELAP	7/24/2008
Titanium	EPA 200.7	Metals	NELAP	9/2/2005
Titanium	EPA 6010	Metals	NELAP	9/2/2005
Toluene	EPA 602	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 624	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 8021	Volatile Organics	NELAP	9/2/2005
Toluene	EPA 8260	Volatile Organics	NELAP	9/2/2005
Total cyanide	EPA 9014	General Chemistry	NELAP	7/24/2008
Total cyanide	SM 4500CN-E	General Chemistry	NELAP	9/2/2005
Total nitrate-nitrite	SM 4500-NO3 F	General Chemistry	NELAP	9/2/2005
Total organic carbon	EPA 9060	General Chemistry	NELAP	4/28/2011

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Total organic carbon	SM 5310 C	General Chemistry	NELAP	7/24/2008
Total organic halides (TOX)	EPA 9020	General Chemistry	NELAP	4/28/2011
Total Petroleum Hydrocarbons (TPH)	EPA 1664A	General Chemistry	NELAP	7/24/2008
Total phenolics	EPA 420.1	General Chemistry	NELAP	7/24/2008
Total phenolics	EPA 420.4	General Chemistry	NELAP	4/28/2011
Total phenolics	EPA 9065	General Chemistry	NELAP	4/28/2011
Toxaphene (Chlorinated camphene)	EPA 608	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Toxaphene (Chlorinated camphene)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	9/2/2005
trans-1,2-Dichloroethylene	EPA 601	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 624	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
trans-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	9/2/2005
trans-1,3-Dichloropropylene	EPA 601	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 624	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8021	Volatile Organics	NELAP	9/2/2005
trans-1,3-Dichloropropylene	EPA 8260	Volatile Organics	NELAP	9/2/2005
trans-1,4-Dichloro-2-butene	EPA 8260	Volatile Organics	NELAP	7/24/2008
Trichloroethene (Trichloroethylene)	EPA 601	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 624	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Trichloroethene (Trichloroethylene)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Trichlorofluoromethane	EPA 601	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 624	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8021	Volatile Organics	NELAP	9/2/2005
Trichlorofluoromethane	EPA 8260	Volatile Organics	NELAP	9/2/2005
Turbidity	SM 2130 B	General Chemistry	NELAP	9/2/2005
Vanadium	EPA 200.7	Metals	NELAP	1/24/2001
Vanadium	EPA 200.8	Metals	NELAP	1/24/2001
Vanadium	EPA 6010	Metals	NELAP	9/2/2005
Vanadium	EPA 6020	Metals	NELAP	9/2/2005
Vinyl acetate	EPA 8260	Volatile Organics	NELAP	7/24/2008
Vinyl chloride	EPA 601	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 624	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8021	Volatile Organics	NELAP	9/2/2005
Vinyl chloride	EPA 8260	Volatile Organics	NELAP	9/2/2005
Xylene (total)	EPA 602	Volatile Organics	NELAP	5/19/2003

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Non-Potable Water

Analyte	Method/Tech	Category	Certification Type	Effective Date
Xylene (total)	EPA 624	Volatile Organics	NELAP	5/19/2003
Xylene (total)	EPA 8021	Volatile Organics	NELAP	9/2/2005
Xylene (total)	EPA 8260	Volatile Organics	NELAP	9/2/2005
Zinc	EPA 200.7	Metals	NELAP	1/24/2001
Zinc	EPA 200.8	Metals	NELAP	1/24/2001
Zinc	EPA 6010	Metals	NELAP	9/2/2005
Zinc	EPA 6020	Metals	NELAP	9/2/2005

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,1,1,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,1,1,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	5/19/2003
1,1,1-Trichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1,1-Trichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1,2,2-Tetrachloroethane	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,1,2,2-Tetrachloroethane	EPA 8260	Volatile Organics	NELAP	5/19/2003
1,1,2-Trichloro-1,2,2-trifluoroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1,1,2-Trichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1,2-Trichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,1-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,1-Dichloropropene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,3-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,3-Trichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,4,5-Tetrachlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8021	Volatile Organics	NELAP	5/19/2003
1,2,4-Trichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2,4-Trichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2,4-Trimethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2,4-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,2-Diphenylhydrazine	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3,5-Trimethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,3,5-Trimethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8270	Extractable Organics	NELAP	2/17/2011
1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

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State Laboratory ID: E87622 **EPA Lab Code:** MI00005 **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
1,3-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,3-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,3-Dinitrobenzene (1,3-DNB)	EPA 8270	Extractable Organics	NELAP	2/17/2011
1,3-Dinitrobenzene (1,3-DNB)	EPA 8330	Extractable Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
1,4-Dichlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,4-Naphthoquinone	EPA 8270	Extractable Organics	NELAP	1/24/2001
1,4-Phenylenediamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
1-Chlorohexane	EPA 8260	Volatile Organics	NELAP	7/24/2008
1-Methylnaphthalene (added to method at FDEP request)	EPA 8270	Extractable Organics	NELAP	7/24/2008
1-Naphthylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,2-Dichloropropane	EPA 8260	Volatile Organics	NELAP	1/24/2001
2,3,4,6-Tetrachlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4,5-T	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4,5-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4,6-Trichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2,4-D	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
2,4-DB	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
2,4-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4-Dimethylphenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4-Dinitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,4-Dinitrotoluene (2,4-DNT)	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,4-Dinitrotoluene (2,4-DNT)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2,6-Dichlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2,6-Dinitrotoluene (2,6-DNT)	EPA 8270	Extractable Organics	NELAP	5/19/2003
2,6-Dinitrotoluene (2,6-DNT)	EPA 8330	Extractable Organics	NELAP	5/19/2003
2-Acetylaminofluorene	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Amino-4,6-dinitrotoluene (2-am-dnt)	EPA 8330	Extractable Organics	NELAP	1/24/2001
2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8021	Volatile Organics	NELAP	1/24/2001
2-Chloroethyl vinyl ether	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Chloronaphthalene	EPA 8270	Extractable Organics	NELAP	5/19/2003

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
2-Chlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Hexanone	EPA 8260	Volatile Organics	NELAP	1/24/2001
2-Methyl-4,6-dinitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Methylnaphthalene	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Methylphenol (o-Cresol)	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Naphthylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
2-Nitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
2-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
2-Picoline (2-Methylpyridine)	EPA 8270	Extractable Organics	NELAP	1/24/2001
3,3'-Dichlorobenzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
3/4-Methylphenols (m/p-Cresols)	EPA 8270	Extractable Organics	NELAP	12/10/2010
3-Methylcholanthrene	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
3-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
4,4'-DDD	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4,4'-DDE	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
4,4'-DDT	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330	Extractable Organics	NELAP	1/24/2001
4-Bromophenyl phenyl ether	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Chloro-3-methylphenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Chloroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Chlorophenyl phenylether	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Chlorotoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
4-Dimethyl aminoazobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Methyl-2-pentanone (MIBK)	EPA 8260	Volatile Organics	NELAP	1/24/2001
4-Nitroaniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
4-Nitrophenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
4-Nitrotoluene	EPA 8330	Extractable Organics	NELAP	1/24/2001
5-Nitro-o-toluidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
7,12-Dimethylbenz(a) anthracene	EPA 8270	Extractable Organics	NELAP	1/24/2001
a-a-Dimethylphenethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acenaphthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Acenaphthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Acenaphthylene	EPA 8270	Extractable Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code: MI00005** **(616) 975-4500**

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Acenaphthylene	EPA 8310	Extractable Organics	NELAP	1/24/2001
Acetone	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acetonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acetophenone	EPA 8270	Extractable Organics	NELAP	1/24/2001
Acrolein (Propenal)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Acrylonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Aldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Allyl chloride (3-Chloropropene)	EPA 8260	Volatile Organics	NELAP	7/24/2008
alpha-BHC (alpha-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
alpha-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Aluminum	EPA 6010	Metals	NELAP	1/24/2001
Amenable cyanide	EPA 9014	General Chemistry	NELAP	4/28/2011
Aniline	EPA 8270	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Anthracene	EPA 8310	Extractable Organics	NELAP	1/24/2001
Antimony	EPA 6020	Metals	NELAP	1/24/2001
Aramite	EPA 8270	Extractable Organics	NELAP	1/24/2001
Aroclor-1016 (PCB-1016)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1221 (PCB-1221)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1232 (PCB-1232)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1242 (PCB-1242)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1248 (PCB-1248)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1254 (PCB-1254)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Aroclor-1260 (PCB-1260)	EPA 8082	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Arsenic	EPA 6010	Metals	NELAP	1/24/2001
Arsenic	EPA 6020	Metals	NELAP	1/24/2001
Barium	EPA 6010	Metals	NELAP	1/24/2001
Barium	EPA 6020	Metals	NELAP	1/24/2001
Benzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Benzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Benzidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
Benzo(a)anthracene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(a)anthracene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(a)pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(a)pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(b)fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Benzo(b)fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(g,h,i)perylene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(g,h,i)perylene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzo(k)fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Benzo(k)fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Benzoic acid	EPA 8270	Extractable Organics	NELAP	1/24/2001
Benzyl alcohol	EPA 8270	Extractable Organics	NELAP	1/24/2001
Beryllium	EPA 6010	Metals	NELAP	1/24/2001
Beryllium	EPA 6020	Metals	NELAP	1/24/2001
beta-BHC (beta-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
bis(2-Chloroethoxy)methane	EPA 8270	Extractable Organics	NELAP	5/19/2003
bis(2-Chloroethyl) ether	EPA 8270	Extractable Organics	NELAP	5/19/2003
bis(2-Chloroisopropyl) ether (2,2'-Oxybis(1-chloropropane))	EPA 8270	Extractable Organics	NELAP	7/24/2008
bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Boron	EPA 6010	Metals	NELAP	1/24/2001
Bromobenzene	EPA 8021	Volatile Organics	NELAP	7/24/2008
Bromobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromochloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Bromodichloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8021	Volatile Organics	NELAP	1/24/2001
Bromoform	EPA 8260	Volatile Organics	NELAP	1/24/2001
Butyl benzyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Cadmium	EPA 6010	Metals	NELAP	1/24/2001
Cadmium	EPA 6020	Metals	NELAP	1/24/2001
Calcium	EPA 6010	Metals	NELAP	1/24/2001
Carbazole	EPA 8270	Extractable Organics	NELAP	5/19/2003
Carbon disulfide	EPA 8260	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Carbon tetrachloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chlordane (tech.)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Chloride	EPA 9056	General Chemistry	NELAP	5/19/2003
Chlorobenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chlorobenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chlorobenzilate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Chloroethane	EPA 8021	Volatile Organics	NELAP	1/24/2001

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Analyte	Method/Tech	Category	Certification Type	Effective Date
Chloroethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8021	Volatile Organics	NELAP	1/24/2001
Chloroform	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chloroprene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Chromium	EPA 6010	Metals	NELAP	1/24/2001
Chromium	EPA 6020	Metals	NELAP	1/24/2001
Chromium VI	EPA 7196	General Chemistry	NELAP	5/19/2003
Chrysene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Chrysene	EPA 8310	Extractable Organics	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
cis-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8021	Volatile Organics	NELAP	1/24/2001
cis-1,3-Dichloropropene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Cobalt	EPA 6010	Metals	NELAP	1/24/2001
Cobalt	EPA 6020	Metals	NELAP	1/24/2001
Copper	EPA 6010	Metals	NELAP	1/24/2001
Copper	EPA 6020	Metals	NELAP	1/24/2001
Dalapon	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
delta-BHC	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Diallate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dibenz(a,h)anthracene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Dibenz(a,h)anthracene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Dibenzofuran	EPA 8270	Extractable Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Dibromochloromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dibromomethane	EPA 8021	Volatile Organics	NELAP	7/24/2008
Dibromomethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dicamba	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Dichlorodifluoromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Dichlorodifluoromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Dichloroprop (Dichlorprop)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dieldrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Diesel range organics (DRO)	EPA 8015	Extractable Organics	NELAP	5/19/2003
Diethyl ether	EPA 8260	Volatile Organics	NELAP	1/24/2001
Diethyl phthalate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Di-isopropylether (DIPE)	EPA 8260	Volatile Organics	NELAP	7/24/2008

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Dimethoate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dimethyl phthalate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Di-n-butyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Di-n-octyl phthalate	EPA 8270	Extractable Organics	NELAP	5/19/2003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endosulfan I	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endosulfan II	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endosulfan sulfate	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endrin	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Endrin aldehyde	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Endrin ketone	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Ethanol	EPA 8015	Volatile Organics	NELAP	1/24/2001
Ethanol	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl acetate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl methacrylate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Ethyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Ethylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Extractable cyanide	EPA 9010/9013	General Chemistry	NELAP	4/28/2011
Famphur	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Fluoranthene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Fluoranthene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Fluorene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Fluorene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Fluoride	EPA 9056	General Chemistry	NELAP	5/19/2003
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
gamma-Chlordane	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Gasoline range organics (GRO)	EPA 8015	Extractable Organics	NELAP	5/19/2003
Heptachlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Heptachlor epoxide	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Hexachlorobenzene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachlorobutadiene	EPA 8260	Volatile Organics	NELAP	5/19/2003
Hexachlorobutadiene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachlorocyclopentadiene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachloroethane	EPA 8260	Volatile Organics	NELAP	7/24/2008

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Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Hexachloroethane	EPA 8270	Extractable Organics	NELAP	5/19/2003
Hexachloropropene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Ignitability	EPA 1020	General Chemistry	NELAP	1/24/2001
Indeno(1,2,3-cd)pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Indeno(1,2,3-cd)pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Iodomethane (Methyl iodide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Iron	EPA 6010	Metals	NELAP	1/24/2001
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8015	Volatile Organics	NELAP	1/24/2001
Isobutyl alcohol (2-Methyl-1-propanol)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isodrin	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Isophorone	EPA 8270	Extractable Organics	NELAP	5/19/2003
Isopropyl alcohol (2-Propanol)	EPA 8015	Volatile Organics	NELAP	1/24/2001
Isopropyl alcohol (2-Propanol)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isopropylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Isosafrole	EPA 8270	Extractable Organics	NELAP	1/24/2001
Kepone	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Lead	EPA 6010	Metals	NELAP	1/24/2001
Lead	EPA 6020	Metals	NELAP	1/24/2001
Lithium	EPA 6010	Metals	NELAP	1/24/2001
m+p-Xylenes	EPA 8260	Volatile Organics	NELAP	9/9/2005
Magnesium	EPA 6010	Metals	NELAP	1/24/2001
Manganese	EPA 6010	Metals	NELAP	1/24/2001
Manganese	EPA 6020	Metals	NELAP	1/24/2001
MCPA	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
MCPP	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Mercury	EPA 7471	Metals	NELAP	1/24/2001
Methacrylonitrile	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methanol	EPA 8015	Volatile Organics	NELAP	1/24/2001
Methapyrilene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Methoxychlor	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methyl bromide (Bromomethane)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methyl chloride (Chloromethane)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl methacrylate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methyl methanesulfonate	EPA 8270	Extractable Organics	NELAP	1/24/2001

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Analyte	Method/Tech	Category	Certification Type	Effective Date
Methyl parathion (Parathion, methyl)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	2/17/2011
Methyl tert-butyl ether (MTBE)	EPA 8021	Volatile Organics	NELAP	5/19/2003
Methyl tert-butyl ether (MTBE)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8021	Volatile Organics	NELAP	1/24/2001
Methylene chloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Molybdenum	EPA 6010	Metals	NELAP	1/24/2001
Molybdenum	EPA 6020	Metals	NELAP	7/24/2008
Naphthalene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Naphthalene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Naphthalene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Naphthalene	EPA 8310	Extractable Organics	NELAP	1/24/2001
n-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	1/24/2001
n-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	1/24/2001
n-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
n-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Nickel	EPA 6010	Metals	NELAP	1/24/2001
Nickel	EPA 6020	Metals	NELAP	1/24/2001
Nitrate	EPA 9056	General Chemistry	NELAP	5/19/2003
Nitrite	EPA 9056	General Chemistry	NELAP	5/19/2003
Nitrobenzene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Nitrobenzene	EPA 8330	Extractable Organics	NELAP	7/24/2008
Nitroquinoline-1-oxide	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodiethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodimethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitroso-di-n-butylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosodi-n-propylamine	EPA 8270	Extractable Organics	NELAP	5/19/2003
n-Nitrosodiphenylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosomethylethylamine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosomorpholine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosopiperidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Nitrosopyrrolidine	EPA 8270	Extractable Organics	NELAP	1/24/2001
n-Propanol	EPA 8260	Volatile Organics	NELAP	7/24/2008
n-Propylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
o,o,o-Triethyl phosphorothioate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EPA 8330	Extractable Organics	NELAP	1/24/2001
o-Toluidine	EPA 8270	Extractable Organics	NELAP	1/24/2001

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Analyte	Method/Tech	Category	Certification Type	Effective Date
o-Xylene	EPA 8260	Volatile Organics	NELAP	9/9/2005
Paint Filter Liquids Test	EPA 9095	General Chemistry	NELAP	1/24/2001
Parathion, ethyl	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	2/17/2011
p-Dioxane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Pentachlorobenzene	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentachloronitrobenzene (Quintozene)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Pentachlorophenol	EPA 8270	Extractable Organics	NELAP	1/24/2001
pH	EPA 9045	General Chemistry	NELAP	1/24/2001
Phenacetin	EPA 8270	Extractable Organics	NELAP	1/24/2001
Phenanthrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Phenanthrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Phenol	EPA 8270	Extractable Organics	NELAP	5/19/2003
Phorate	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	2/17/2011
p-Isopropyltoluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Potassium	EPA 6010	Metals	NELAP	1/24/2001
Pronamide (Kerb)	EPA 8270	Extractable Organics	NELAP	1/24/2001
Propionitrile (Ethyl cyanide)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Pyrene	EPA 8270	Extractable Organics	NELAP	5/19/2003
Pyrene	EPA 8310	Extractable Organics	NELAP	5/19/2003
Pyridine	EPA 8270	Extractable Organics	NELAP	1/24/2001
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Safrole	EPA 8270	Extractable Organics	NELAP	1/24/2001
sec-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
sec-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Selenium	EPA 6010	Metals	NELAP	1/24/2001
Selenium	EPA 6020	Metals	NELAP	7/24/2008
Silver	EPA 6010	Metals	NELAP	1/24/2001
Silver	EPA 6020	Metals	NELAP	1/24/2001
Silvex (2,4,5-TP)	EPA 8151	Pesticides-Herbicides-PCB's	NELAP	7/24/2008
Sodium	EPA 6010	Metals	NELAP	1/24/2001
Strontium	EPA 6010	Metals	NELAP	1/24/2001
Styrene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Styrene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Sulfate	EPA 9038	General Chemistry	NELAP	7/24/2008
Sulfate	EPA 9056	General Chemistry	NELAP	5/19/2003
Sulfide	EPA 9030/9034	General Chemistry	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Sulfotepp	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Synthetic Precipitation Leaching Procedure	EPA 1312	General Chemistry	NELAP	1/24/2001
tert-Butyl alcohol	EPA 8015	Volatile Organics	NELAP	1/24/2001
tert-Butyl alcohol	EPA 8260	Volatile Organics	NELAP	1/24/2001
tert-Butylbenzene	EPA 8021	Volatile Organics	NELAP	1/24/2001
tert-Butylbenzene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Tetrachloroethylene (Perchloroethylene)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	Extractable Organics	NELAP	1/24/2001
Thallium	EPA 6010	Metals	NELAP	1/24/2001
Thallium	EPA 6020	Metals	NELAP	1/24/2001
Thionazin (Zinophos)	EPA 8270	Pesticides-Herbicides-PCB's	NELAP	1/24/2001
Tin	EPA 6010	Metals	NELAP	1/24/2001
Tin	EPA 6020	Metals	NELAP	7/24/2008
Titanium	EPA 6010	Metals	NELAP	5/19/2003
Toluene	EPA 8021	Volatile Organics	NELAP	1/24/2001
Toluene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Total cyanide	EPA 9014	General Chemistry	NELAP	9/2/2005
Total nitrate-nitrite	EPA 9056	General Chemistry	NELAP	5/19/2003
Total organic carbon	WALKLEY-BLACK	General Chemistry	NELAP	9/2/2005
Total phenolics	EPA 9065	General Chemistry	NELAP	7/24/2008
Toxaphene (Chlorinated camphene)	EPA 8081	Pesticides-Herbicides-PCB's	NELAP	5/19/2003
Toxicity Characteristic Leaching Procedure	EPA 1311	General Chemistry	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
trans-1,2-Dichloroethylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8021	Volatile Organics	NELAP	1/24/2001
trans-1,3-Dichloropropylene	EPA 8260	Volatile Organics	NELAP	1/24/2001
trans-1,4-Dichloro-2-butene	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Trichloroethene (Trichloroethylene)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8021	Volatile Organics	NELAP	1/24/2001
Trichlorofluoromethane	EPA 8260	Volatile Organics	NELAP	1/24/2001
Vanadium	EPA 6010	Metals	NELAP	1/24/2001
Vanadium	EPA 6020	Metals	NELAP	7/24/2008
Vinyl acetate	EPA 8260	Volatile Organics	NELAP	1/24/2001
Vinyl chloride	EPA 8021	Volatile Organics	NELAP	1/24/2001

Laboratory Scope of Accreditation

Attachment to Certificate #: E87622-21, expiration date June 30, 2012. This listing of accredited analytes should be used only when associated with a valid certificate.

State Laboratory ID: E87622 **EPA Lab Code:** MI00005 (616) 975-4500

E87622
TriMatrix Laboratories, Inc.
5560 Corporate Exchange Court SE
Grand Rapids, MI 49512

Matrix: Solid and Chemical Materials

Analyte	Method/Tech	Category	Certification Type	Effective Date
Vinyl chloride	EPA 8260	Volatile Organics	NELAP	1/24/2001
Xylene (total)	EPA 8021	Volatile Organics	NELAP	1/24/2001
Xylene (total)	EPA 8260	Volatile Organics	NELAP	1/24/2001
Zinc	EPA 6010	Metals	NELAP	1/24/2001
Zinc	EPA 6020	Metals	NELAP	1/24/2001

APPENDIX C

IDW DISPOSAL DOCUMENTATION

USCG ATWATER
IDW DRUM SUMMARY
5/20/2010

Drum No.	Contents	IDW sample
1	Soil and PPE/acetate liners (~3/4 full)	DA-IDW-01
2	Aqueous (~1/3 full) of decon water.	DA-IDW-02

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-IDW-01**	Sampled:	04/21/10 11:40
Lab Sample ID:	**1004372-30**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/22/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
pH	**8.3**	1.0	1.0	pH Units	1	USEPA-9045C	04/27/10 12:23	KRK	1003912

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-IDW-01**	Sampled:	04/21/10 11:40
Lab Sample ID:	**1004372-30**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/22/10 16:48
Percent Solids:	n/a		

TCLP Metals by EPA 1311/6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	0.10	U	0.10	0.067	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877
***Barium**	**0.61**		0.35	0.0036	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877
Cadmium	0.010	U	0.010	0.0047	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877
Chromium	0.050	U	0.050	0.0098	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877
Lead	0.050	U	0.050	0.033	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877
*Mercury	0.00020	U	0.00020	0.000061	mg/L	1	USEPA-7470A	05/04/10 13:01	KLV	1004098
Selenium	0.10	U	0.10	0.053	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877
Silver	0.010	U	0.010	0.0034	mg/L	1	USEPA-6010C	04/29/10 12:02	JMF	1003877

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-IDW-01**	Sampled:	04/21/10 11:40
Lab Sample ID:	**1004372-30**	Sampled By:	Ms. Shannon Hill
Matrix:	Soil	Received:	04/22/10 16:48
Unit:	mg/L	Prepared:	05/02/10 By: JDM
Dilution Factor:	100	Analyzed:	05/03/10 By: JDM
QC Batch:	1004163	Analytical Batch:	0E03063
Percent Solids:	n/a		

TCLP Volatile Organics by EPA Method 1311/8260B

CAS Number	Analyte	Analytical Result	RL	MDL
71-43-2	Benzene	0.10U	0.10	0.018
56-23-5	Carbon Tetrachloride	0.10U	0.10	0.013
108-90-7	Chlorobenzene	0.10U	0.10	0.019
67-66-3	Chloroform	0.10U	0.10	0.017
107-06-2	1,2-Dichloroethane	0.10U	0.10	0.013
75-35-4	1,1-Dichloroethene	0.10U	0.10	0.013
78-93-3	2-Butanone (MEK)	5.0U	5.0	0.55
127-18-4	Tetrachloroethene	0.10U	0.10	0.016
79-01-6	Trichloroethene	0.10U	0.10	0.0092
75-01-4	Vinyl Chloride	0.10U	0.10	0.010

Surrogates:	*% Recovery*	*Control Limits*
Dibromofluoromethane	98	*79-124*
1,2-Dichloroethane-d4	101	*75-128*
Toluene-d8	98	*87-113*
4-Bromofluorobenzene	95	*70-121*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-IDW-02**	Sampled:	04/21/10 11:45
Lab Sample ID:	**1004372-31**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	04/22/10 16:48

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
pH	**8.8**	0.1	0.1	pH Units	1	USEPA-9045C	04/27/10 12:29	KRK	1003909

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-IDW-02**	Sampled:	04/21/10 11:45
Lab Sample ID:	**1004372-31**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	04/22/10 16:48

TCLP Metals by EPA 1311/6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	0.10	U	0.10	0.067	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970
Barium	**0.0092**	**J**	0.35	0.0036	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970
Cadmium	0.010	U	0.010	0.0047	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970
Chromium	0.050	U	0.050	0.0098	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970
Lead	0.050	U	0.050	0.033	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970
Mercury	**0.000065**	**J**	0.00020	0.000061	mg/L	1	USEPA-7470A	05/04/10 13:41	KLV	1004101
Selenium	0.10	U	0.10	0.053	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970
Silver	0.010	U	0.010	0.0034	mg/L	1	USEPA-6010C	04/29/10 10:45	JMF	1003970

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1004372**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-IDW-02**	Sampled:	04/21/10 11:45
Lab Sample ID:	**1004372-31**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	04/22/10 16:48
Unit:	mg/L	Prepared:	05/02/10 By: JDM
Dilution Factor:	100	Analyzed:	05/03/10 By: JDM
QC Batch:	1004163	Analytical Batch:	0E03063

TCLP Volatile Organics by EPA Method 1311/8260B

CAS Number	Analyte	Analytical Result	RL	MDL
71-43-2	Benzene	0.10U	0.10	0.018
56-23-5	Carbon Tetrachloride	0.10U	0.10	0.013
108-90-7	Chlorobenzene	0.10U	0.10	0.019
67-66-3	Chloroform	0.10U	0.10	0.017
107-06-2	1,2-Dichloroethane	0.10U	0.10	0.013
75-35-4	1,1-Dichloroethene	0.10U	0.10	0.013
78-93-3	2-Butanone (MEK)	5.0U	5.0	0.55
127-18-4	Tetrachloroethene	0.10U	0.10	0.016
79-01-6	Trichloroethene	0.10U	0.10	0.0092
75-01-4	Vinyl Chloride	0.10U	0.10	0.010

Surrogates:	*% Recovery*	*Control Limits*
Dibromofluoromethane	96	*79-124*
1,2-Dichloroethane-d4	106	*75-128*
Toluene-d8	99	*87-113*
4-Bromofluorobenzene	94	*70-121*

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Chain of Custody Record

COC No. 133657

Pg. 1 of 4

Analyses Requested

For Lab Use Only
Cust: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000
VOA Rack/Tray: 46 62 (WRK)
Fraction Log No: 33 41
Project Code: (QA)
Work Order No: 1004372

Client Name: Tetra Tech NUS
Address: 661 Andersen Drive
City, State Zip:
Phone/Fax:
Email:
Project Name:
Client Project No. / P.O. No.:
Invoice To: ☐ Client ☐ Other (comments)
Contact/Report To:

PRESERVATIVES: A NONE pH<7; B HNO_3 pH<2; C H_2SO_4 pH<2; D 1+1 HCl pH<2; E NaOH pH>12; F ZnAc/NaOH pH>9; G MeOH; H Other (note below)

Container Type (Containers to Container Factory List)

Sample Number	Matrix Code	Sample Number	Field Sample ID	Cooler ID	Sample Date	Sample Time	Matrix	Number of Containers Submitted									Total	Sample Comments
								TCLP VOC	TCLP metals	pH	PAH ⑥	Metals ⑥						
04		30	DA-1DW-01	TM 2447		1140	Soil	x	x	x							2	
05		31	DA-1PW-02	↓		1145	Aq	3	1	1							5	CONTAINERS (a, 2, 3)
01		32	DASB101-0002			1105	Soil				x	x					1	
↓		33	DASB101-0305			1110	Soil				x	x					1	

Sampled By (print): Shannon Hill
Sampler's Signature:
Company: TtNUS

How Shipped? Hand ___ Carrier X
Tracking No:

Comments:

Relinquished By	Date	Time	Received By	Date	Time
1	4/21/10	1230	2	4/21/10	1330
2	4/21/10	1330	3	4/21/10	1648
3	4/21/10	1648	4	4/21/10	1648
4	4/21/10	1648			

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
MI2 690 308 471	1	(313) 347-1300	007200818 JJK

GENERATOR

5. Generator's Name and Mailing Address: USCG SECTOR DETROIT
110 MOUNT ELLIOT AVE
DETROIT, MI 48207
Generator's Phone: (313) 568-9561

Generator's Site Address (if different than mailing address):
UNITED STATES COAST GUARD
2660 EAST ATWATER STREET
DETROIT, MI 48207

6. Transporter 1 Company Name: EQ INDUSTRIAL SERVICES — U.S. EPA ID Number: MID 000 283 871

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: EQ DETROIT, INC.
1923 FREDERICK
DETROIT, MI 48211
Facility's Phone: (313) 347-1300
U.S. EPA ID Number: MID 980 991 586

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Non Hazardous Liquid Waste, Not Dot Not RCRA Regulated	001	DM	0010	G	0281
	2. NON HAZARDOUS SOLID WASTE, NOT DOT NOT RCRA REGULATED	001	DM	0100	P	
	3.					
	4.					

14. Special Handling Instructions and Additional Information
01. F107164DET / Non Haz IDW Liquids 02. F107163DET / Non Haz IDW Solids

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: SCOTT MASON — Signature: [signature] — Month: 06 — Day: 10 — Year: 2010

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Raymond Root — Signature: [signature] — Month: 06 — Day: 10 — Year: 10

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month — Day — Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
LIW	NONE		

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in item 18a

Printed/Typed Name: [illegible] — Signature: [signature] — Month: 06 — Day: 10 — Year: 10

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **DESIGNATED FACILITY TO GENERATOR**

CERTIFICATE OF MANAGEMENT

This Certificate is to verify that the wastes specified on the following manifest(s) have been properly received and will be properly managed to meet all applicable local, state, and federal regulations.

Generator Name:	United States Coast Guard	
Manifest/BOL Number:	007200818 JJK	
Approval Number(s):	F107164DET	
	F107163DET	

FACILITY NAME: EQ DETROIT, INC.
EPA ID#:MID980991566

ADDRESS: 1923 Frederick

PHONE NUMBER: 313-347-1300
FAX NUMBER: 313.923.3375

AUTHORIZED SIGNATURE: Rachel Micarli 6/10/10

USCG ATWATER
IDW DRUM SUMMARY
7/1/2011

Drum No.	Contents	IDW sample or GW sample
1	Soil MW 4	Disposal-01 (representative of this drum)
2	Soil MW 3	Disposal-01 (sample was collected from this drum)
3	Soil MW 2	Disposal-01 (representative of this drum)
4	Soil MW 1	Disposal-01 (representative of this drum)
5	Development water MW 1	DA-GW-01-062011
6	Development water MW 3	DA-GW-03-062011
7	Development water MWs 2 and 4	DA-GW-02-062011 and DA-GW-04-062011
8	Purge water MWs 1, 2, 3, and 4	DA-GW-01-062011, DA-GW-02-062011, DA-GW-03-062011, and DA-GW-04-062011

IDW ANALYSES AND CHAIN OF CUSTODY FORMS

For DRUMS 1, 2, 3, and 4

TRIMATRIX LABORATORIES

No- 1,2,3,4

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**Disposal-01**	Sampled:	05/25/11 13:30
Lab Sample ID:	**1105435-01**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Percent Solids:	n/a		

TCLP Metals by EPA 1311/6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	0.50	U	0.50	0.035	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156
***Barium**	**0.84**		0.35	0.0063	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156
Cadmium	**0.0087**	**J**	0.050	0.0020	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156
Chromium	0.25	U	0.25	0.0046	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156
Lead	**0.057**	**J**	0.25	0.015	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156
*Mercury	0.00020	U	0.00020	0.000055	mg/L	1	USEPA-7470A	06/01/11 09:54	DSC	1105236
Selenium	0.20	U	0.20	0.076	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156
Silver	0.050	U	0.050	0.0041	mg/L	1	USEPA-6010C	06/03/11 12:01	KLV	1105156

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

Nl. 1, 2, 3, 4

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**Disposal-01**	Sampled:	05/25/11 13:30
Lab Sample ID:	**1105435-01**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45
Unit:	mg/L	Prepared:	06/02/11 By: LEW
Dilution Factor:	100	Analyzed:	06/02/11 By: LEW
QC Batch:	1105409	Analytical Batch:	1F03014
Percent Solids:	n/a		

TCLP Volatile Organics by EPA Method 1311/8260B

CAS Number	Analyte	Analytical Result	RL	MDL
71-43-2	Benzene	0.10U	0.10	0.012
56-23-5	Carbon Tetrachloride	0.10U	0.10	0.014
108-90-7	Chlorobenzene	0.10U	0.10	0.013
67-66-3	Chloroform	0.10U	0.10	0.016
107-06-2	1,2-Dichloroethane	0.10U	0.10	0.012
75-35-4	1,1-Dichloroethene	0.10U	0.10	0.017
78-93-3	2-Butanone (MEK)	5.0U	5.0	0.028
127-18-4	Tetrachloroethene	0.10U	0.10	0.016
79-01-6	Trichloroethene	0.10U	0.10	0.018
75-01-4	Vinyl Chloride	0.10U	0.10	0.024

Surrogates:	*% Recovery*	*Control Limits*
Dibromofluoromethane	103	*79-124*
1,2-Dichloroethane-d4	101	*75-128*
Toluene-d8	100	*87-113*
4-Bromofluorobenzene	98	*70-121*

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TRIMATRIX LABORATORIES

No. 1, 2, 3 & 4

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1105435**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**Disposal-01**	Sampled:	05/25/11 13:30
Lab Sample ID:	**1105435-01**	Sampled By:	C.W.
Matrix:	Soil	Received:	05/26/11 08:45

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
pH	**8.5**	0.1		pH Units	1	USEPA-9045C	05/31/11 12:00	CLB	1105240

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Chain of Custody Record

COC No. 138762

Pg. 1 of 2

Analyses Requested

PRESERVATIVES
A NONE pH-7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Client Name	TETRA TECH NUS, INC.
Address	661 ANDERSEN DR
City, State Zip	PITTSBURGH, PA 15220
Phone/Fax	(412) 921-7090 / (412) 921-4040
Email	JOE.LOGAN@TETRATECH.COM
Project Name	USCG ATWATER
Client Project No. / P.O. No.	112602435
Invoice To	☒ Client ☐ Other (comments)
Contact/Report To	TOORENA SEDLACEK

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted: PAH 8270C	Hg 7471A	TCLP VOCs	TCLP METALS	TCLP pH	Total	Sample Comments
1	DISPOSAL-01		5/25/11	1330	X		SOIL			1	1	1	2	250ml. 125ml.
2	DA-SS-102-0002			0920		X		1	1	1			2	MS/MSD 2-250ml.
3	DA-SB-102-0406			0925				1	1				1	250ml. glass
4	DA-SS-FD-01			0000				1	1				1	
5	DA-SB-FD-01			0000				1	1				1	
6	DA-SS-104-0002			1100				1	1				1	
7	DA-SB-104-0204			1105				1	1				1	
8	DA-SS-106-0002			1310				1	1				1	
9	DA-SB-106-0204			1315				1	1				1	
10	DA-SS-109-0002			1115		X	SOIL	1	1				1	

Sampled By (print)	CHARLIE WARWD	How Shipped? Hand ___ Carrier FED EX	Comments
Sampler's Signature		Tracking No. 8747 4934 2590	
Company	TETRA TECH	1. Relinquished By / Date 5/25 / Time 1600	2. Relinquished By / Date / Time
		1. Received By / Date / Time	2. Received By / Date / Time

3. Relinquished By / Date / Time

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Chain of Custody Record

COC No. 138763

Pg. 1 of 2

Analyses Requested

PAH 8270C
Hg 7471A

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Client Name	Project Name
TETRA TECH NUS, INC.	USCG ATWATER
Address	**Client Project No. / P.O. No.**
661 ANDERSEN DR	112602435
City, State Zip	**Invoice To** ☑ Client ☐ Other (comments)
PITTSBURGH, PA 15220	
Phone/Fax 412-921-7090 / 412-921-4040	**Contact/Report To**
Email JOE.LOGAN@TETRATECH.COM	TOBRENA SEDLMEYER

	Field Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted												Total	Sample Comments
1	DA-SB-109-0204		5/25/11	1120		X	SOIL	1	1											1	
2	DA-SB-110-0305			1155				1	1											1	
3	DA-SS-110-0002			1150				1	1											1	
4	DA-SS-111-0002			1220				1	1											1	
5	DA-SB-111-0305			1225				1	1											1	
6	DA-SS-112-0002			1340				1	1											1	
7	DA-SB-112-0204			1345				1	1											1	
8	DA-SB-115-0804			1400				1	1											1	
9	DA-SS-115-0002		5/25/11	1355		X	SOIL	1	1											1	
10																					

Sampled By (print) CHARLIE WARWICK	How Shipped? Hand ___ Carrier FED EX	**Comments**
Sampler's Signature	**Tracking No.** 8747 4934 2590	
Company TETRA TECH	1. Relinquished By [signature] Date 5/25 Time 1600	2. Relinquished By Date Time
	1. Received By Date Time	2. Received By Date Time

3. Relinquished By Date Time [redacted]

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GROUNDWATER ANALYSES AND CHAIN OF CUSTODY FORMS

For DRUMS 5, 6, 7, and 8

TRIMATRIX LABORATORIES

Dsum 5 :8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-01-062011**	Sampled:	06/06/11 14:10
Lab Sample ID:	**1106105-01**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/10/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F10052

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL
83-32-9	Acenaphthene	<0.50U	0.50
208-96-8	Acenaphthylene	<0.50U	0.50
120-12-7	Anthracene	<0.50U	0.50
56-55-3	Benzo(a)anthracene	<0.50U	0.50
50-32-8	Benzo(a)pyrene	<0.50U	0.50
205-99-2	Benzo(b)fluoranthene	<0.50U	0.50
207-08-9	Benzo(k)fluoranthene	<0.50U	0.50
191-24-2	Benzo(g,h,i)perylene	<0.50U	0.50
218-01-9	Chrysene	<0.50U	0.50
53-70-3	Dibenz(a,h)anthracene	<0.50U	0.50
206-44-0	Fluoranthene	<0.50U	0.50
86-73-7	Fluorene	<0.50U	0.50
193-39-5	Indeno(1,2,3-cd)pyrene	<0.50U	0.50
91-57-6	2-Methylnaphthalene	<0.50U	0.50
91-20-3	Naphthalene	<0.50U	0.50
85-01-8	Phenanthrene	<0.50U	0.50
129-00-0	Pyrene	<0.50U	0.50

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	70	*40-110*
2-Fluorobiphenyl	57	*50-110*
o-Terphenyl	73	*50-135*

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TRIMATRIX LABORATORIES

Dnm. 5 : 8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-01-062011**	Sampled:	06/06/11 14:10
Lab Sample ID:	**1106105-01**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.5**	J	5.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Barium	**210**		10	ug/L	5	USEPA-6020A	06/14/11 16:38	MSM	1105591
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:16	MSM	1105591
Chromium	**0.31**	J	1.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Copper	**0.74**	J	1.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Lead	**0.73**	J	1.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 10:55	KLV	1105860
*Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:16	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
*Zinc	**6.9**		5.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

Dna 7/8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/10/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL
83-32-9	Acenaphthene	**6.0**	0.50
208-96-8	Acenaphthylene	**1.7**	0.50
120-12-7	Anthracene	**3.8**	0.50
56-55-3	Benzo(a)anthracene	**0.28J**	0.50
50-32-8	Benzo(a)pyrene	<0.50U	0.50
205-99-2	Benzo(b)fluoranthene	<0.50U	0.50
207-08-9	Benzo(k)fluoranthene	**0.050J**	0.50
191-24-2	Benzo(g,h,i)perylene	<0.50U	0.50
218-01-9	Chrysene	**0.10J**	0.50
53-70-3	Dibenz(a,h)anthracene	<0.50U	0.50
206-44-0	Fluoranthene	**0.52**	0.50
86-73-7	Fluorene	**3.5**	0.50
193-39-5	Indeno(1,2,3-cd)pyrene	<0.50U	0.50
91-57-6	2-Methylnaphthalene	**24**	0.50
*91-20-3	Naphthalene	**63**	0.50
85-01-8	Phenanthrene	**8.8**	0.50
129-00-0	Pyrene	**0.39J**	0.50

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	54	*40-110*
2-Fluorobiphenyl	**42**	*50-110*
o-Terphenyl	73	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

Dmc 7:8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.2**		5.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Barium	**150**		10	ug/L	5	USEPA-6020A	06/14/11 16:44	MSM	1105591
Cadmium	**0.075**	**J**	0.20	ug/L	1	USEPA-6020A	06/14/11 18:23	MSM	1105591
Chromium	**0.33**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Copper	**1.2**		1.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Lead	**0.85**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:09	KLV	1105860
Selenium	**1.0**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 18:23	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Zinc	**3.9**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591

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Dual 7 & 8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02RE1**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	10	Analyzed:	06/13/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F14026

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL
83-32-9	Acenaphthene	**8.1**	5.0
208-96-8	Acenaphthylene	<5.0U	5.0
120-12-7	Anthracene	**3.6J**	5.0
56-55-3	Benzo(a)anthracene	**0.50J**	5.0
50-32-8	Benzo(a)pyrene	<5.0U	5.0
205-99-2	Benzo(b)fluoranthene	<5.0U	5.0
207-08-9	Benzo(k)fluoranthene	<5.0U	5.0
191-24-2	Benzo(g,h,i)perylene	<5.0U	5.0
218-01-9	Chrysene	<5.0U	5.0
53-70-3	Dibenz(a,h)anthracene	<5.0U	5.0
206-44-0	Fluoranthene	**0.50J**	5.0
86-73-7	Fluorene	**4.8J**	5.0
193-39-5	Indeno(1,2,3-cd)pyrene	<5.0U	5.0
91-57-6	2-Methylnaphthalene	**35**	5.0
91-20-3	Naphthalene	**120**	5.0
85-01-8	Phenanthrene	**8.3**	5.0
129-00-0	Pyrene	**0.90J**	5.0

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	57	*40-110*
2-Fluorobiphenyl	59	*50-110*
o-Terphenyl	85	*50-135*

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Dup. 6 of 8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-03-062011**	Sampled:	06/06/11 15:15
Lab Sample ID:	**1106105-03**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/11/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL
83-32-9	Acenaphthene	**1.6**	0.50
208-96-8	Acenaphthylene	**0.050J**	0.50
120-12-7	Anthracene	**0.22J**	0.50
56-55-3	Benzo(a)anthracene	<0.50U	0.50
50-32-8	Benzo(a)pyrene	<0.50U	0.50
205-99-2	Benzo(b)fluoranthene	<0.50U	0.50
207-08-9	Benzo(k)fluoranthene	<0.50U	0.50
191-24-2	Benzo(g,h,i)perylene	<0.50U	0.50
218-01-9	Chrysene	<0.50U	0.50
53-70-3	Dibenz(a,h)anthracene	<0.50U	0.50
206-44-0	Fluoranthene	**0.20J**	0.50
86-73-7	Fluorene	**0.36J**	0.50
193-39-5	Indeno(1,2,3-cd)pyrene	<0.50U	0.50
91-57-6	2-Methylnaphthalene	**0.070J**	0.50
91-20-3	Naphthalene	**0.19J**	0.50
85-01-8	Phenanthrene	**1.2**	0.50
129-00-0	Pyrene	**0.15J**	0.50

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	72	*40-110*
2-Fluorobiphenyl	63	*50-110*
o-Terphenyl	76	*50-135*

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ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-03-062011**	Sampled:	06/06/11 15:15
Lab Sample ID:	**1106105-03**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**2.6**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Barium	**290**		10	ug/L	5	USEPA-6020A	06/14/11 16:45	MSM	1105591
Cadmium	**0.051**	**J**	0.20	ug/L	1	USEPA-6020A	06/14/11 18:24	MSM	1105591
Chromium	**0.29**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Copper	**0.77**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Lead	**0.47**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:14	KLV	1105860
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:24	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Zinc	**8.5**		5.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591

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Dup 2.8

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-04-062011**	Sampled:	06/06/11 13:34
Lab Sample ID:	**1106105-04**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55
Unit:	ug/L	Prepared:	06/08/11 By: SKA
Dilution Factor:	1	Analyzed:	06/11/11 By: JLB
QC Batch:	1105556	Analytical Batch:	1F13077

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL
83-32-9	Acenaphthene	**0.050J**	0.50
208-96-8	Acenaphthylene	<0.50U	0.50
120-12-7	Anthracene	<0.50U	0.50
56-55-3	Benzo(a)anthracene	<0.50U	0.50
50-32-8	Benzo(a)pyrene	<0.50U	0.50
205-99-2	Benzo(b)fluoranthene	<0.50U	0.50
207-08-9	Benzo(k)fluoranthene	<0.50U	0.50
191-24-2	Benzo(g,h,i)perylene	<0.50U	0.50
218-01-9	Chrysene	<0.50U	0.50
53-70-3	Dibenz(a,h)anthracene	<0.50U	0.50
206-44-0	Fluoranthene	<0.50U	0.50
86-73-7	Fluorene	<0.50U	0.50
193-39-5	Indeno(1,2,3-cd)pyrene	<0.50U	0.50
91-57-6	2-Methylnaphthalene	<0.50U	0.50
91-20-3	Naphthalene	**0.050J**	0.50
85-01-8	Phenanthrene	**0.050J**	0.50
129-00-0	Pyrene	**0.040J**	0.50

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	74	*40-110*
2-Fluorobiphenyl	62	*50-110*
o-Terphenyl	75	*50-135*

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TRIMATRIX LABORATORIES

Dup, 7.18

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-04-062011**	Sampled:	06/06/11 13:34
Lab Sample ID:	**1106105-04**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**3.0**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Barium	**150**		10	ug/L	5	USEPA-6020A	06/14/11 16:47	MSM	1105591
Cadmium	**0.060**	**J**	0.20	ug/L	1	USEPA-6020A	06/14/11 18:26	MSM	1105591
Chromium	**0.36**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Copper	**2.6**		1.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Lead	**2.1**		1.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:19	KLV	1105860
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:26	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Zinc	**110**		25	ug/L	5	USEPA-6020A	06/14/11 16:47	MSM	1105591

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Chain of Custody Record

COC No. 138929

Pg. 1 of 1

00011

Client Name: TETRA TECH NUS, INC.
Project Name: USCG ATWATER
Address: 661 ANDERSEN DR
Client Project No. / P.O. No.:
City, State Zip: PITTSBURGH, PA 15220
Invoice To: ☐ Client ☐ Other (comments)
Phone/Fax: 412-921-7090 412-921-4090
Contact/Report To: TOBRENA SEDLMAYER
Email: JOEL.LOGAN@TETRATECH.COM

Analyses Requested

	A	B	D																			
	PAH	TOTAL METALS	DISS. METALS																			
1	DA-GW-01-062011	Φ1	6/6/11	1410		X	GW	4	2	2												MS/MSD
2	DA-GW-02-062011	Φ1		1530		X		2	1	1												
3	DA-GW-03-062011	Φ2		1515		X		2	1	1												
4	DA-GW-04-062011	Φ2		1334		X		2	1	1												
5	DA-GW-FD-01	Φ2	6/6/11	0000		X	GW	2	1	1												
6																						
7																						
8																						
9																						
10																						

Number of Containers Submitted

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): CHARLES WARNO
Sampler's Signature:
Company: TETRA TECH

How Shipped? Hand ___ Carrier FED EX
Tracking No. 8747 4934 2580

1. Relinquished By: Date 6/6/11 Time 1800
1. Received By: Date Time

2. Relinquished By: Date Time
2. Received By: Date Time

3. Relinquished By: Date Time

Comments:

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

008271648JJK

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MI2 690 308 471	1	(313) 347-1300	008271648 JJK

GENERATOR

5. Generator's Name and Mailing Address: USCG SECTOR DETROIT
C/O EARTH SMART ENV.
525 E. MICHIGAN AVE. #124
SALINE, MI 48176
Generator's Phone: (313) 568-9551

Generator's Site Address (if different than mailing address):
UNITED STATES COAST GUARD
2660 EAST ATWATER STREET
DETROIT, MI 48207

6. Transporter 1 Company Name: EQ INDUSTRIAL SERVICES — U.S. EPA ID Number: MI0 000 263 871

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: EQ DETROIT, INC.
1923 FREDERICK
DETROIT, MI 48211
Facility's Phone: (313) 347-1300
U.S. EPA ID Number: MID 980 991 566

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Non Hazardous Liquid Waste, Not Dot Not RCRA Regulated	004	DM	0220	G	D28L
	2. NON HAZARDOUS SOLID WASTE, NOT DOT NOT RCRA REGULATED	004	DM	2000	P	
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. F107164DET / Non Haz IDW Liquids 2. F107163DET / Non Haz IDW Solids

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: MIKE COOPER — Signature: [signature] — Month: 07 Day: 20 Year: 11

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Raymond Root — Signature: [signature] — Month: 07 Day: 20 Year: 11

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month — Day — Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
LIW	NONE		

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Eric Lane — Signature: [signature] — Month: 7 Day: 20 Year: 11

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

CERTIFICATE OF MANAGEMENT

This Certificate is to verify that the wastes specified on the following manifest(s) have been properly received and will be properly managed to meet all applicable local, state, and federal regulations.

Generator Name:	United States Coast Guard	
Manifest/BOL Number:	008271648JJK 7-20-11	
Approval Number(s):	F107164DET	
	F107163DET	

FACILITY NAME: EQ DETROIT, INC.
EPA ID#:MID980991566

ADDRESS: 1923 Frederick

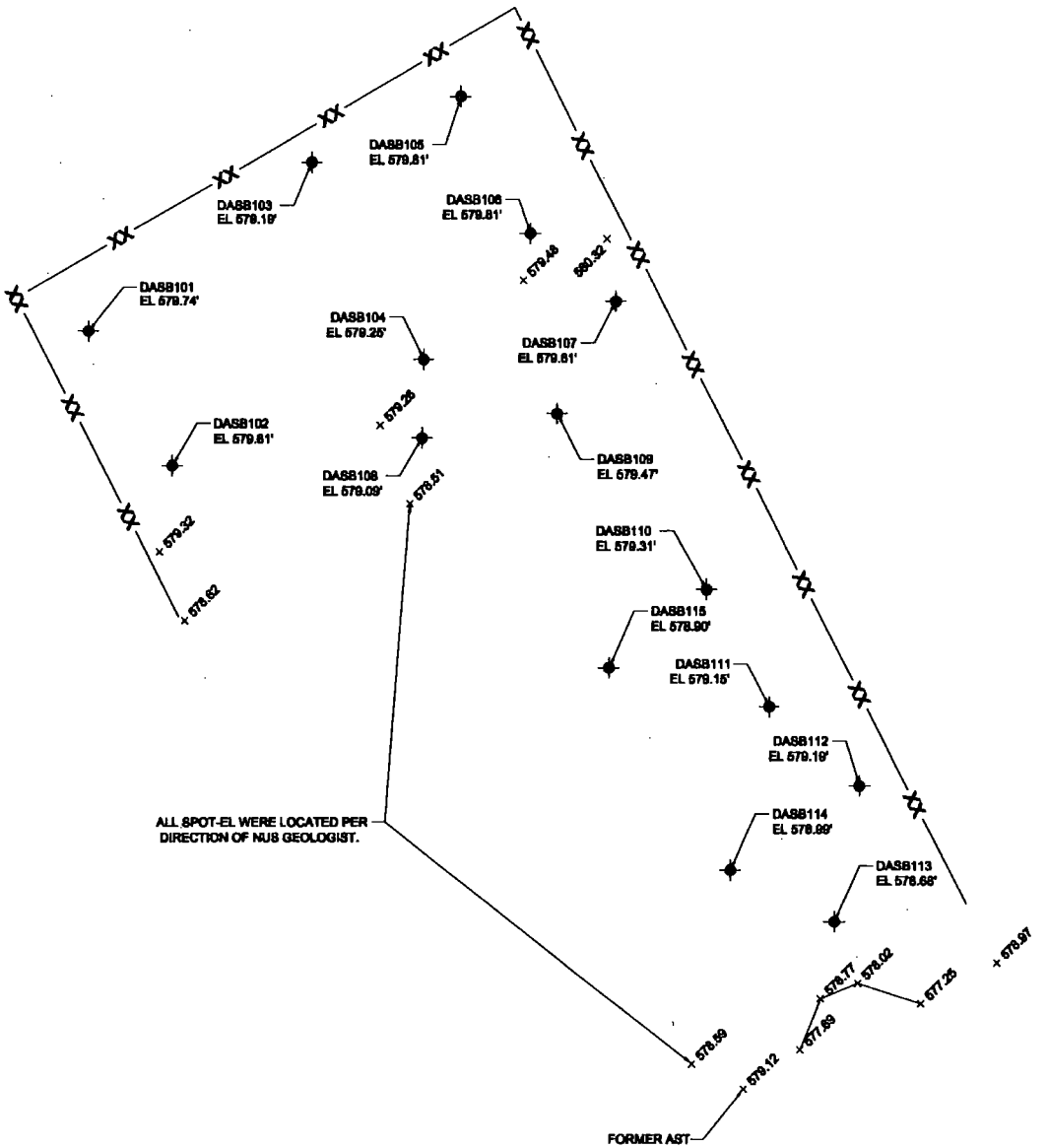
PHONE NUMBER: 313-347-1300
FAX NUMBER: 313.923.3375

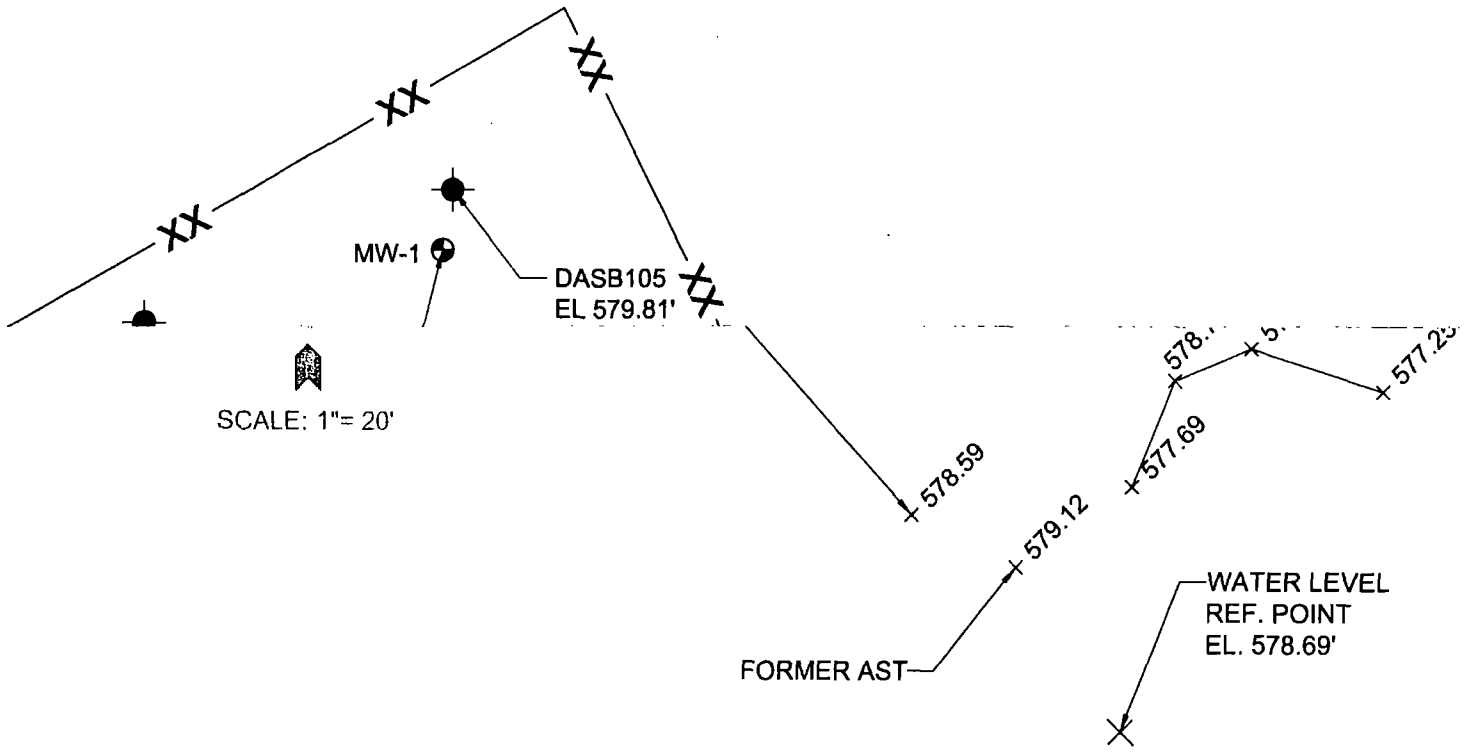
AUTHORIZED SIGNATURE: Rachel Yucarelli 7-29-11

D

APPENDIX D

SURVEY INFORMATION


DASB105
EL 579.81'
DASB103
EL 579.19'
DASB106
EL 579.81'
579.48
580.32
DASB101
EL 579.74'
DASB104
EL 579.25'
DASB107
EL 579.61'
579.26
DASB102
EL 579.61'
DASB109
EL 579.47'
DASB108
EL 579.09'
578.51
579.32
578.62
DASB110
EL 579.31'
DASB115
EL 578.90'
DASB111
EL 579.15'
DASB112
EL 579.19'
ALL SPOT-EL WERE LOCATED PER
DIRECTION OF NUS GEOLOGIST.
DASB114
EL 578.99'
DASB113
EL 578.68'
578.97
578.77
578.02
577.25
577.69
578.59
579.12
FORMER AST


MW-1
DASB105
EL 579.81'
SCALE: 1"= 20'
578.59
579.12
FORMER AST
577.69
577.2
WATER LEVEL
REF. POINT
EL. 578.69'

E

APPENDIX E

HUMAN HEALTH RISK ASSESSMENT

APPENDIX E – HUMAN HEALTH RISK ASSESSMENT

1.0 INTRODUCTION

A human health risk assessment (HHRA) for soil and groundwater was conducted by Tetra Tech NUS, Inc. (Tetra Tech) on behalf of the United States Coast Guard (USCG) for USCG Atwater located Detroit, Michigan. USCG Atwater was described in detail in Site Investigation (SI) Report Section 1.0 and is comprised of an approximately half-acre of land located along the Detroit River. A summary of the environmental investigations conducted at USCG Atwater is provided in SI Report Section 1.0, and a discussion of the nature and extent of contamination detected in the soil and groundwater of the site is presented in SI Report Section 3.0. Summaries of analytical data and summaries of detected concentrations used in the HHRA are presented in Attachments 1 and 2, respectively.

This HHRA presents a description of the risk assessment methods employed for the USCG Atwater site as well as a summary of the results. The objective of the risk assessment is to determine whether detected concentrations of chemicals within the study area pose a significant threat to potential human receptors under current and/or future land use. The site is currently unoccupied, but current land use is industrial in nature with access restricted by fences and no buildings present; however, future land use of the Atwater site could include recreational, residential, or commercial uses. Therefore, recreational and residential receptors are evaluated in this HHRA in addition to industrial receptors (i.e., construction workers, industrial workers) to aid in risk-management decisions.

The HHRA was performed using United States Environmental Protection Agency's (USEPA's) Risk Assessment Guidance for Superfund (RAGS) and supplemental guidance documents (see reference section). This HHRA is structured and reported according to the guidelines of the *RAGS, Human Health Evaluation Manual, and Part D: Standardized Planning, Reporting, and Review of Superfund Risk Assessments* (RAGS Part D) (USEPA, 2001). RAGS Part D tables are presented in Attachment 3. The potential risks to human receptors are estimated based on the assumption that no actions are taken to control contaminant releases. The baseline risk assessment consists of five major components:

- Data evaluation and identification of chemicals of potential concern (COPCs)
- Exposure Assessment (Identification of significant exposure pathways and calculation of the exposure point concentration)
- Toxicity assessment
- Risk Characterization (Estimation of potential human health risks)
- Characterization of uncertainty in the risk assessment

2.0 DATA EVALUATION

Data evaluation is a site-specific task that uses a variety of information to determine which of the detected chemicals in each medium are most likely to present a risk to potential receptors and at what concentrations. This section presents the approaches for identification of COPCs and exposure point concentrations (EPCs). The end result of this qualitative selection process is a list of COPCs and representative EPCs. EPCs are defined as the contaminant concentrations at the point of exposure.

The soil data used in this HHRA for USCG Atwater include metals and polycyclic aromatic hydrocarbon (PAH) chemical data for soil samples collected in April 2010 and re-samples of PAH and mercury data collected in May 2011. Some locations were re-sampled for PAH and mercury data as discussed in SI Report Section 2.0. When a location was re-sampled for PAHs and mercury, only the re-sampled results for PAHs and mercury were used in the HHRA data set. Soil data collected in 2001 and 2006 were not used in the HHRA because these data were not validated. However, the previous unvalidated soil results are similar to the validated soil results included in the HHRA in terms of concentrations of detected chemicals. Tables E-1 and E-2 list the surface and subsurface soil data, respectively, that were used in the HHRA. Surface soil was defined as 0 to 2 feet below ground surface (bgs), and subsurface soil was defined as greater than 2 feet bgs.

The groundwater data used in this HHRA were collected in June 2011 and include PAH, metals, and dissolved metals data. Table E-3 lists the groundwater data used in the HHRA. Figure 2-1 of the SI Report displays the sampling locations for soil and groundwater samples (note that data from previous sampling locations were not used in the HHRA as explained above).

2.1 SELECTION OF COPCS

COPCs were selected to represent site contamination and to provide the framework for the quantitative HHRA. COPCs include only those chemicals with positive detections and are limited to those chemicals that exceed a selection criterion. Residential criteria were conservatively used at this site to be protective of all potential future site uses because the residential receptor is the most conservative receptor.

For soil, USEPA regional screening levels (RSLs) for residential soil (June 2011) provided the basis for screening criteria used to reduce the number of chemicals and exposure routes considered in the risk assessment. The residential soil RSLs were developed with conservative exposure assumptions designed to represent a residential land use scenario. Michigan Department of Environmental Quality

(MDEQ) Residential Soil Generic Cleanup Criteria (March 25, 2011) for direct contact were also used as screening criteria. Maximum detected concentrations of each chemical in surface and subsurface soil at the site were compared to the RSLs and MDEQ criteria. A chemical was selected as a soil COPC if the maximum detected concentration was greater than the associated RSL representing a human cancer risk of $1x10^{-6}$ or a non-cancer hazard quotient (HQ) of 0.1 or the MDEQ criterion representing a cancer risk of $1x10^{-5}$ or a non-cancer HQ of 1. Soil criteria used for COPC selection are summarized in Table E-4. Protection of drinking water criteria and groundwater to surface water criteria (both essentially leachability criteria) were not compared to soil data in this HHRA because correspondence between the State of Michigan and the City of Detroit indicates that the City will not be required to meet these criteria for the soil cleanup efforts.

USEPA does not have soil-to-indoor air criteria. Therefore, the vapor intrusion pathway was evaluated using groundwater data only. However, MDEQ does have soil volatilization to indoor air criteria. The soil data in this HHRA were screened against the MDEQ soil volatilization criteria (March 25, 2011) for completeness in the uncertainties section (Section 6.0).

For groundwater, USEPA RSLs for tap water (June 2011) were used as screening criteria. The tap water RSLs were developed using conservative exposure assumptions to represent domestic use of a water supply. MDEQ Residential Drinking Water Criteria (March 25, 2011) and Federal Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) for public drinking water supplies (USEPA, January 2011) were also used as groundwater screening criteria. Primary MCLs are designed to prevent adverse human health effects but also reflect the technical feasibility of removing a contaminant from water. Primary (i.e., health-based) and secondary (i.e., aesthetic-based) MCLs are promulgated under the SDWA. Maximum detected concentrations of each chemical in groundwater at the site were compared to the USEPA and MDEQ criteria. A chemical was selected as a groundwater COPC if the maximum detected concentration was greater than the associated RSL representing a human cancer risk of $1x10^{-6}$ or a non-cancer HQ of 0.1 or the MDEQ criteria representing a cancer risk of $1x10^{-5}$ or a non-cancer HQ of 1 or the federal MCL. Groundwater data were also compared to USEPA criteria for vapor intrusion into indoor air calculated using USEPA's Vapor Intrusion Screening Level (VISL) calculator (Version 2.0) (USEPA, 2012) and current toxicity values. MDEQ values for Residential Groundwater Volatilization to Indoor Air (March 25, 2011) were used for the vapor intrusion screening; however, these screening values were either not available or were by default the hazardous substance-specific water solubility limits. Groundwater criteria used in the HHRA are summarized in Table E-5.

PAHs were assessed in compliance with USEPA's Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons (USEPA, 1993) for the assignment of Toxicity Equivalence Factors (TEFs). These TEFs are based on the relative potency of several of the

carcinogenic PAH compounds to that of benzo(a)pyrene. The TEFs are used to convert individual carcinogenic PAH concentrations into an equivalent concentration of benzo(a)pyrene. Using individual benzo(a)pyrene equivalents (BAP equivalents) concentrations for the available samples, an EPC for BAP equivalents is derived. One half of the detection limit for non-detected carcinogenic PAHs is used in the calculation. If all the carcinogenic PAHs were not detected in a sample, then the sample quantitation limit for benzo(a)pyrene was used as the equivalent concentration for that sample. In groundwater, only three of the BAP equivalents constituents (i.e., benzo(a)anthracene, benzo(k)fluoranthene, and chrysene) were detected in any of the groundwater samples; therefore, only these three chemicals were included in the BAP equivalents calculations for groundwater.

Screening criteria for hexavalent chromium were conservatively used for total chromium in the absence of chromium speciation data.

Screening criteria were not available for acenapthylene, phenanthrene, and benzo(g,h,i)perylene. The USEPA screening value for acenaphthene was used as a surrogate screening value for acenaphthylene, and the screening value for pyrene was used as a surrogate screening value for phenanthrene and benzo(g,h,i)perylene.

No background data are available for the site. However, soil background data developed by the MDEQ are available for inorganics in soil and are presented on the soil COPC tables. MDEQ considers these background values to be fixed values (not statistically-derived values) for comparisons to site data. When statistical analyses of site data are appropriate, the 95 percent upper confidence limit (UCL) on the mean of the site data can be compared to the MDEQ background values (MDEQ, 2002).

2.2 DIRECT CONTACT COPC SELECTION FOR SURFACE SOIL

This section presents the results of the direct contact COPC selection process for surface soil. Table E-6 (RAGS Part D Table 2.1) shows the results of the comparison of the maximum detected surface soil concentrations to screening levels based on the USEPA RSLs for residential soil and the MDEQ cleanup criteria. The following chemicals were retained as COPCs for surface soil:

- Metals: arsenic, chromium, copper, and lead.
- PAHs: BAP equivalents, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

These constituents were identified as COPCs in surface soil because maximum concentrations exceeded one or more of the screening criteria.

2.3 DIRECT CONTACT COPC SELECTION FOR SUBSURFACE SOIL

This section presents the results of the direct contact COPC selection process for subsurface soil. Table E-7 (RAGS Part D Table 2.2) shows the results of the comparison of the maximum detected surface soil concentrations to screening levels based on the USEPA RSLs for residential soil and the MDEQ cleanup criteria. The following chemicals were retained as COPCs for subsurface soil:

- Metals: arsenic, chromium, and lead.
- PAHs: BAP equivalents, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and ideno(1,2,3-cd)pyrene.

These constituents were identified as COPCs in subsurface soil because maximum concentrations exceeded one or more of the screening criteria.

2.4 DIRECT CONTACT COPC SELECTION FOR GROUNDWATER

This section presents the results of the direct contact COPC selection process for groundwater. Table E-8 (RAGS Part D Table 2.3) shows the results of the comparison of the maximum detected groundwater concentrations to screening levels based on the USEPA RSLs for tap water, MDEQ residential groundwater cleanup criteria, and USEPA MCLs. The following chemicals were retained as COPCs for groundwater:

- Total (Unfiltered) metals: arsenic and chromium.
- Dissolved (Filtered) metals: arsenic and chromium.
- PAHs: 2-methylnaphthalene, BAP equivalents, benzo(a)anthracene, and naphthalene.

These constituents were identified as COPCs in groundwater because maximum concentrations exceeded one or more of the screening criteria.

2.5 VAPOR INTRUSION COPC SELECTION FOR GROUNDWATER

The groundwater data were also screened against USEPA criteria for vapor intrusion into indoor air calculated using USEPA's VISL calculator (Version 2.0) (USEPA, 2012) and current toxicity values. Table E-9 (RAGS Part D Table 2.4) presents the results of the vapor intrusion screening. Naphthalene

was retained as a COPC for vapor intrusion because its maximum concentration exceeded the risk-based screening level for vapor intrusion.

2.6 SUMMARY OF COPC SELECTION

Table E-10 presents the results of the COPC selection process for surface soil, subsurface soil, and groundwater. Chemicals selected as COPCs are evaluated quantitatively in the HHRA.

3.0 EXPOSURE ASSESSMENT

The exposure assessment defines and evaluates the exposures that may be experienced by a receptor population. To have an exposure, several factors must be present: there must be a source of contamination, there must be a mechanism through which a receptor can come into contact with the contaminants in that medium, and there must actually (or potentially) be a receptor present at the point of contact.

Site sources of contamination are largely unknown because of limited site history. However, the USCG Atwater site was previously used for storage of building materials, old buoys, and boat motors, and a maintenance building and a six-car garage were formerly located on the site. There were no observations or reports of chemical or container storage on the site. It is also possible that fill of an unknown origin may have been brought onto the site.

The exposure assessment consists of several steps that characterize the receptors of concern, identify the potential contaminant exposure pathways, and present the equations and assumptions used to quantify exposure in terms of contaminant intake (dose).

3.1 POTENTIAL ROUTES OF EXPOSURE

A receptor can come into contact with contaminants in a variety of ways, which are generally the result of interactions between a receptor's behavior or lifestyle and an exposure medium. This assessment defines an exposure pathway as a stylized description of the behavior that brings a receptor into contact with a contaminated medium.

The media evaluated in this HHRA are surface soil, subsurface soil, and groundwater. Receptors may come into direct contact with soil affected by the release of chemicals from source areas. During the receptor's period of contact, the individual may be exposed via inadvertent ingestion of a small amount of

soil or via dermal absorption of certain contaminants from the soil. Inhalation of volatiles/fugitive dust is also a potential exposure pathway. Certain receptors may be exposed to groundwater through ingestion, dermal contact, or inhalation of volatiles. Vapor intrusion of volatiles in groundwater through the subsurface into overlying buildings is also a potential exposure route for some receptors.

3.2 POTENTIAL RECEPTORS

Currently, no buildings are located on the site, the site is unoccupied, and access is restricted by a fence with a locked gate along Atwater Street and fences along the eastern and western sites of the property, although trespassers may access the site for fishing. However, several potential receptors have been identified under future land use conditions. These receptors were identified by analyzing the interaction of current and anticipated (or hypothetical) future land use practices and the identified contaminated environmental media. The USCG Atwater property will be given to the City of Detroit through a land trade between the USCG and the City. The parcel will be incorporated into the Detroit Waterfront plan and the River Walk will be extended through the property. Although the area including USCG Atwater is currently zoned for industrial use, the future zoning is intended to be for high intensity residential and commercial mixed use development. It is anticipated that future land use could include recreational, commercial (e.g., retail), or residential (e.g., multiple family dwellings, town houses) uses as well as industrial uses. Potential receptors include: future construction workers, future industrial workers, future recreational users, and future residents. Table E-11 presents the potential exposure pathways for the receptors identified, lists the type of evaluation conducted (i.e., quantitative, qualitative, or none) and the rationale for the evaluation conducted. A summary of the pathways evaluated quantitatively for each receptor is as follows:

- **Future Construction Workers** – Exposures to surface and subsurface soil via ingestion, dermal contact, and inhalation; exposures to groundwater in an excavation trench via ingestion and dermal contact, and inhalation of volatiles emanating from the groundwater in a trench.
- **Future Industrial Workers** – Exposures to surface and subsurface soil via ingestion, dermal contact, and inhalation; exposure to groundwater via vapor intrusion into an industrial building.
- **Future Recreational Users (Child, Adult, and Lifelong)** – Exposures to surface and subsurface soil via ingestion, dermal contact, and inhalation.
- **Hypothetical Future Residents (Child, Adult, and Lifelong)** – Exposures to surface and subsurface soil via ingestion, dermal contact, and inhalation; exposures to groundwater via ingestion, dermal contact, inhalation while showering, and vapor intrusion into a residential building.

3.3 EXPOSURE POINT CONCENTRATIONS

Table E-12 presents the EPCs for each COPC selected for surface soil, subsurface soil, and groundwater as well as the statistical values on which these EPCs are based. The EPCs are also presented in the RAGS Part D Table 3s included in Attachment 3. Generally, the 95 percent UCL on the mean is selected as the EPC for soil. For groundwater, the maximum concentration was used because data from only four wells and one round of sampling were available. The EPCs were calculated in accordance with USEPA guidance (2010a), which states that statistics may be unreliable if less than five samples or three positive detections are included in a data set. The 95 percent UCLs on the mean for soil COPCs were calculated following USEPA's Calculating UCLs for EPCs at Hazardous Waste Sites (USEPA, 2002a) and using USEPA's ProUCL (Version 4.1.00, 2010a) software. Mean concentrations were used for lead in accordance with USEPA guidance (1994, 2010b, and 2003a). Attachment 4 contains ProUCL output files.

3.4 CHEMICAL INTAKE ESTIMATION

Table E-13 presents a summary of exposure assumptions for each receptor. The exposure assumptions are also presented in the RAGS Part D Table 4s included in Attachment 3. The listed exposure assumptions were selected to be consistent with the current USEPA guidance. Exposure assumptions were developed for the Reasonable Maximum Exposure (RME) scenario only. The RME scenario uses values that represent the upper distribution or "high-end" of population exposure for most exposure parameters in order to provide an upper bound of the possible risk. The RME is conceptually the "high end" exposure, above the 90th percentile of the population distribution, but not higher than the individual in the population with the highest exposure. Therefore, the RME scenario represents a "reasonable worst case" exposure scenario. An average case or central tendency exposure (CTE) scenario was not evaluated because the RME scenario is more conservative than the CTE scenario and is typically the basis of risk management decisions. The intake estimation methods used in this assessment are presented below. Example calculations are presented in Attachment 5.

Incidental Ingestion of Soil. Intakes associated with soil ingestion are estimated using the following equation (USEPA, 1989):

$$\text{Intake} = \frac{(C_S)(IR_S)(FI)(EF)(ED)(CF)}{(BW)(AT)}$$

where:

Intake	=	ingestion intake
C_s	=	chemical concentration in soil (mg/kg)
IR_s	=	soil ingestion rate (mg/day)

FI	=	fraction ingested from contaminated source (unitless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
CF	=	conversion factor (1×10^{-6} kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days) for non-carcinogens: 365 days/year x ED for carcinogens: 365 days/year x 70 years

Most of the exposure assumptions used to estimate chemical intakes from incidental ingestion of soil are based on default assumptions described in USEPA guidance. Several exposure assumptions for ingestion of soil (e.g., exposure frequencies for the construction worker and recreational user) are not based on USEPA default values; the rationale for these values is presented in Table E-13.

Dermal Absorption of Soil. Doses for dermal contact with soil are estimated using the following equation (USEPA, 2004a):

$$\text{Intake} = \frac{(C_S)(CF)(SA)(SSAF)(DABS)(EV)(EF)(ED)}{(BW)(AT)}$$

where:

DEX	=	dermal dose (mg/kg-day)
C_s	=	chemical concentration in soil (mg/kg)
SA	=	skin surface area available for contact (cm^2/day)
SSAF	=	soil-to-skin adherence factor (mg/cm^2)
DABS	=	absorption factor (unitless)
EV	=	events frequency (events/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
CF	=	conversion factor (1×10^{-6} kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days) for non-carcinogens: 365 days/year x ED for carcinogens: 365 days/year x 70 years

The same exposure frequencies, exposure durations, and body weights previously identified for the ingestion route of exposure are used to characterize dermal contact with soil. Most of the exposure assumptions used to estimate chemical intakes from dermal contact with soil are based on default

assumptions described in USEPA guidance. The exposure assumptions used and the rationale for the values are presented in Table E-13.

Inhalation of Air Containing Fugitive Dust/Volatiles Emitted from Soil. Intakes of both particulates and vapors/gases are calculated using the same equation, as follows (USEPA, 2009a):

$$EC = \frac{(C_{air})(ET)(EF)(ED)}{(AT)(24\ hours/day)}$$

where:

EC	=	exposure concentration (mg/m^3)
C_{air}	=	concentration of chemical in air (mg/m^3)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
BW	=	body weight (kg)
AT	=	averaging time (days) for non-carcinogens, AT = ED x 365 days per year for carcinogens, AT = 70 years x 365 days per year

Most of the exposure assumptions that will be used to estimate chemical intakes from inhalation of fugitive dusts/volatile emissions from surface/subsurface soil are based on default assumptions described in the standard USEPA guidance (Table E-13). The same exposure frequencies and durations used to estimate incidental ingestion of soil intakes are used to estimate exposure via inhalation of fugitive dust/volatile emissions for soil.

The concentrations of chemicals in air resulting from emissions from soil are developed following procedures presented in USEPA Soil Screening Guidance (2002b). The chemical concentration in air is calculated as follows:

$$C_{air} = C_{soil} \times \left[\frac{1}{PEF} + \frac{1}{VF}\right]$$

where:

C_{air}	=	chemical concentration in air, mg/m^3
C_s	=	chemical concentration in soil, mg/kg
PEF	=	particulate emission factor, m^3/kg
VF	=	volatilization factor, m^3/kg

No VOCs were identified as COPCs in soil; therefore, the above equation reduces to:

$$C_{air} = C_{soil} \times \frac{1}{PEF}$$

The particulate emissions factor (PEF) relates the concentration of a chemical in soil with the concentration of dust particles in air. A PEF value of $9.5 \times 10^{+8}$ m^3/kg was obtained from USEPA's Soil Screening Internet site located at http://rais.ornl.gov/epa/ssl1.shtml. This is the default value for Cleveland, Ohio which is the closest city to Detroit listed on the Internet site. Because air emissions resulting from fugitive dust emissions settings will be different than dust emissions generated during construction activities, a separate PEF was used for construction activities. The PEF for construction workers ($1.43 \times 10^{+6}$ m^3/kg) was calculated using the equations presented in the supplemental SSL guidance document (USEPA, 2002b). A sample calculation showing how the PEF was calculated is presented in Attachment 5.

Ingestion of Groundwater. Intakes for direct ingestion of groundwater are estimated using the following general equation (USEPA, 1989):

$$\text{Intake} = \frac{CGW \times CF \times IR \times EF \times ED}{BW \times AT}$$

where:

Intake	=	ingestion intake (mg/kg-day)
CGW	=	chemical concentration in groundwater (mg/L)
CF	=	conversion factor (0.001 mg/ug)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days) for non-carcinogens: 365 days/year x ED for carcinogens: 365 days/year x 70 years

The same exposure frequencies, exposure durations, and body weights previously identified for exposure to soil are used to characterize ingestion with groundwater. All exposure assumptions are summarized on Table E-13.

Dermal Contact with Groundwater. The following equations are used to estimate doses resulting from dermal contact with groundwater (USEPA, 2004a):

$$DAD = \frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$$

where:

DAD	=	dermal dose (mg/kg-day)
DA_{event}	=	dose per event (mg/cm^2/event)
EV	=	event frequency (events/day)
ED	=	exposure duration (years)
EF	=	exposure frequency (days/year)
SA	=	skin surface area available for contact (cm^2)
BW	=	body weight (kg)
AT	=	averaging time (days) for non-carcinogens: 365 days/year x ED for carcinogens: 365 days/year x 70 years

The absorbed dose per event (DA_{event}) is estimated using a nonsteady-state approach for organic compounds and a traditional steady-state approach for inorganics. The following equations apply for organic chemicals:

$$\text{If } t_{event} < t^*, \text{ then: } DA_{event} = 2 \times FA \times K_p \times C \times CF \times \left(\frac{\sqrt{6 \tau t_{event}}}{\pi} \right)$$

$$\text{If } t_{event} > t^*, \text{ then: } DA_{event} = FA \times K_p \times C \times CF \times \left(\frac{t_{event}}{1+B} + 2\tau \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right)$$

where:

t_{event}	=	duration of event (hour/event)
t^*	=	time it takes to reach steady-state conditions (hour)
FA	=	fraction absorbed (dimensionless) – chemical specific
K_p	=	permeability coefficient from water through skin (cm/hour)
C	=	concentration of chemical in surface water (mg/L)
τ	=	lag time (hour)
π	=	constant (unitless; equal to 3.1416)
CF	=	conversion factor ($1x10^{-3}$ L/cm^3)
B	=	partitioning constant derived by Bunge Model (dimensionless)

Values for the chemical-specific parameters (t^*, K_p, τ, and B) are obtained from the current dermal guidance (USEPA, 2004a, Exhibit B-3) and are presented in Table E-14. If published values are not

available for a particular compound, they are calculated using equations provided in the USEPA dermal guidance.

The following equation was used to estimate DA_{event} for inorganics:

$$DA_{event} = K_p \times C \times t_{event}$$

The recommended default value of $1x10^{-3}$ was used for inorganic chemicals, unless chemical-specific data were available in RAGS Part E.

The same exposure frequencies, exposure durations, and body weights previously identified for exposure to soil and ingestion of groundwater are used to characterize dermal contact with groundwater. Exposure parameters for exposure to groundwater are summarized in Table E-13.

Inhalation of Volatiles in Groundwater. If volatiles are present, groundwater exposure may also result in chemical intake through inhalation if groundwater is used as a domestic water supply or is exposed during construction activities. This exposure route is plausible for residential receptors that may be exposed while showering, bathing, washing dishes, etc. or for construction workers contacting shallow groundwater during excavation activities. For residential receptors, chemical intakes from inhalation exposure while showering due to volatilization of COPCs in groundwater were estimated using a mass transfer model, developed specifically for this exposure route, in combination with an air intake estimation model. The mass transfer model accounts for inhalation during and after a shower while the receptor remains in a closed bathroom. The method used is as follows (USEPA, 1989, and Foster and Chrostowski, 1987, USEPA, 2009a):

$$EC = (S)(ET)(K)(EF)(ED)/(AT)(R_a)(CFs)$$

$$K = D_s + \frac{\exp(-R_a \times D_t)}{R_a} - \frac{\exp\left[R_a \times (D_s - D_t)\right]}{R_a}$$

where:

EC	=	exposure concentration (mg/m^3)
S	=	volatile-chemical generation rate ($\mu g/m^3$-min— shower)
ET	=	exposure time (hours/day)
K	=	mass-transfer coefficient (min)
EF	=	exposure frequency (showers/yr)
ED	=	exposure duration (yr)

AT	=	averaging time or period of exposure (hours) for non-carcinogens, AT = EDx365 days per yearx24 hours per day; for carcinogens, AT = 70 yearsx365 days per year x24 hours per day
R_a	=	air-exchange rate (min^{-1})
CFs	=	conversion factors ($1x10^{+3}$ µg/mg and 1,440 min/day)
D_S	=	shower duration (min)
D_t	=	total time in bathroom (min)

The estimated volatile chemical generation rate is based on two-phase film theory. The model uses contaminant-specific mass transfer coefficients, Henry's Law Constants, droplet diameter, drop time, viscosity, temperature, etc. A sample calculation is provided in Attachment 5. The same exposure frequencies and durations used to estimate intake for dermal contact with groundwater were used to evaluate chemical intakes for inhalation of VOCs from domestic groundwater use.

Inhalation exposures for the construction worker were estimated using an air intake estimation model, as follows (USEPA, 2009a):

$$EC = \frac{(C_{air})(ET)(EF)(ED)}{(AT)(24\ hrs/day)}$$

where:

EC	=	exposure concentration (mg/ m^3)
C_{air}	=	chemical concentration in air (mg/m^3)
ET	=	exposure time (hours/day)
EF	=	exposure frequency (days/yr)
ED	=	exposure duration (yr)
AT	=	averaging time (days) for non-carcinogens, AT = EDx365 days per year for carcinogens, AT = 70 yearsx365 days per year

Construction workers may be exposed to COPCs that have volatilized from groundwater when an excavation exposes the shallow water table. The same exposure frequencies and times used to estimate intake from dermal contact with groundwater were used to evaluate intake from inhalation of volatiles from groundwater during construction.

No well-established models are available for estimating migration of volatiles from groundwater into a construction or utility trench. To estimate the EPCs for air in a construction trench, the HHRA used an

approach suggested by the Virginia Department of Environmental Quality (VDEQ) (2007), which is based on a combination of a vadose zone model (to estimate volatilization of gases from contaminated groundwater into a trench) and a box model (to estimate contaminant dispersion from the air inside the trench to the above-ground atmosphere). The VDEQ methodology is described in the following paragraphs.

The airborne concentration of a contaminant in a trench can be estimated using the following equation:

$$C_{air} = C_{GW} \times VF$$

where:

C_{air}	=	contaminant concentration in air in the trench ($\mu g/m^3$)
C_{GW}	=	concentration of contaminant in groundwater ($\mu g/L$)
VF	=	volatilization factor (L/m^3)

It was assumed that a construction project could excavate to 15 feet bgs or less. If the depth to groundwater at a site is less than 15 feet, the VDEQ model assumes that a worker would encounter groundwater when digging an excavation or trench. The worker would then be directly exposed to the groundwater. The worker would also be exposed to contaminants in the air inside the trench due to volatilization from groundwater pooling in the trench bottom.

The following equation is used to calculate the volatilization factor (VF) for a trench less than 15 feet deep:

$$VF = (Ki \times A \times F \times 10^{-3} \times 10^{4} \times 3{,}600)/(ACH \times V)$$

where:

Ki	=	contaminant's overall mass-transfer coefficient (cm/s)
A	=	trench area (m^2)
F	=	fraction of floor through which contaminant can enter (unitless)
ACH	=	air changes per hour (h^{-1}) = 360 h^{-1}
V	=	trench volume (m^3)
10^{-3}	=	conversion factor (L/cm^3)
10^{4}	=	conversion factor (cm^2/m^2)
3,600	=	conversion factor (seconds/hour)

Studies of urban canyons suggest that if the ratio of trench width, relative to wind direction and trench depth, is less than or equal to one, a circulation cell(s) will be created in the trench, limiting the degree of gas exchanged with the atmosphere. Thus, measured building ventilation rates lead to an assumption of two air changes per hour (ACH). If the width-to-depth ratio of the trench is greater than one, the air exchange between the trench and above-ground atmosphere is unrestricted, based on the ratio of trench depth to average wind speed, so the ACH is assumed to be 360. The exposure assessment in this HHRA assumes that the width-to-trench depth ratio is greater than one; thus, the ACH is set at 360.

K_i is calculated using the following equation:

$$K_i = 1/\{(1/k_iL) + [(RT)/(H_i\ k_iG)]\}$$

where:

K_i	=	contaminant's overall mass-transfer coefficient (cm/s)
k_iL	=	liquid-phase mass-transfer coefficient of i (cm/s)
R	=	ideal gas constant (atm-m^3/mole-°K) = 8.2×10^{-5}
T	=	average system absolute temperature (°K) (Default = 298°K)
H_i	=	Henry's Law Constant of i (atm-m^3/mole)
k_iG	=	gas-phase mass-transfer coefficient of i (cm/s)

Formulae for calculating k_iL and k_iG are as follows:

$$k_iL = (MWO_2/MW_i)^{0.5} \times (T/298) \times kL,O_2$$

where:

k_iL	=	liquid-phase mass-transfer coefficient of component i (cm/s)
MWO_2	=	molecular weight of oxygen (g/mole)
MW_i	=	molecular weight of component i (g/mole)
kL,O_2	=	liquid-phase mass-transfer coefficient of oxygen at 25°C (cm/s) = 0.002 cm/s

$$k_iG = (MWH_2O/MW_i)^{0.335} \times (T/298)^{1.005 \times} kG,H_2O$$

where:

k_iG	=	gas-phase mass-transfer coefficient of component i (cm/s)
MWH_2O	=	molecular weight of water (g/mole)

kG,H_2O = gas-phase mass-transfer coefficient of water vapor at 25°C (cm/s)
= 0.833 cm/s (USEPA, 1988)

Chemical properties for volatiles in groundwater were obtained from the USEPA RSL Table (June 2011) and are presented in Table E-15.

Inhalation of Volatiles via Vapor Intrusion from Groundwater into Indoor Air. Volatilization of chemicals from groundwater into indoor air may occur, thereby exposing individuals inside buildings or dwellings. Therefore, potential risks associated with chemical concentrations in indoor air as a result of vapor migration from impacted groundwater are evaluated for future industrial workers and hypothetical future residents. The Johnson and Ettinger Vapor Intrusion Model (USEPA, 2004b) is used to determine the indoor air concentration of a chemical that is present in groundwater. The model assumes that vapors of volatile chemicals are emitted from groundwater, migrate through surface and subsurface soil through cracks in the building foundation, and accumulate in air inside buildings. The Johnson and Ettinger model assumes that residential dwellings have been constructed on the site and that the dimensions of these buildings and ventilation rates are typical of residential dwellings in the United States. The results of the vapor intrusion evaluation are presented in the Risk Characterization (Section 5.0), and uncertainty associated with the Johnson and Ettinger volatilization model is discussed in Section 6.0. Input values and results of the vapor intrusion model are included in Attachment 6.

Exposures to Lead. Lead was selected as a COPC for direct contact with surface soil and subsurface soil. The equations and methodology presented in the previous section cannot be used to evaluate exposure to lead because of the absence of published dose-response parameters. Thus, exposure to lead was assessed using the following models:

- The latest version of USEPA's IEUBK Model for Lead (2010b). This model is typically used to evaluate lead exposure assuming a residential land-use scenario.

- USEPA's TRW Model for Lead (2003a and 2009b). This model is typically used to evaluate lead exposure assuming a non-residential land-use scenario.

The IEUBK model for lead (USEPA, 1994 and 2010b) is designed to estimate blood levels of lead in children under 7 years old based on either default or site-specific input values for air, drinking water, diet, dust, and soil exposure. Studies indicate that infants and young children are extremely susceptible to adverse effects from exposure to lead. Considerable behavioral and developmental impairments have been noted in children with elevated blood-lead levels. The threshold for toxic effects from this chemical is believed to be in the range of 10 to 15 micrograms per deciliter (µg/dL). Blood-lead levels greater than 10 µg/dL are considered a "concern."

USEPA's TRW model for lead (2003a and 2009b) is used to evaluate non-residential exposures to lead. In this model, adult exposure to lead in soil is addressed by evaluating the relationship between lead concentrations in site soil and the blood-lead concentrations in the developing fetuses of adult women. The Adult Lead Model generates a spreadsheet for each exposure scenario evaluated (i.e., industrial and recreational). Model outputs are the probabilities that blood-lead concentrations in fetuses will exceed 10 µg/L. These probabilities are calculated in accordance with the following USEPA guidelines:

- Use of the TRW Interim Adult Lead-Methodology in Risk Assessment (1999)
- Frequently Asked Questions (FAQs) on the Adult Lead Model (2010c)

Lead concentrations in soil data sets are evaluated qualitatively in Section 5.0 to determine if using the IEUBK model and Adult Lead Model would be necessary in this HHRA.

No models are currently available to evaluate periodic exposure of child recreational users to lead; therefore, the results of the IEUBK model for children were used to qualitatively assess this receptor's exposure risk. Potential adverse effects from exposure to lead are expected to be of lesser magnitude for child recreational users than for young children based on less frequent exposures.

Assessing Cancer Risks from Early Life Exposures. USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005a) recommends making adjustments to the toxicity of carcinogenic chemicals which act via the mutagenic mode of action when evaluating early life exposures. The guidance recommends using age dependent adjustment factors (ADAFs) combined with age specific exposure estimates when assessing cancer risks. In the absence of chemical specific data the supplemental guidance recommends the following default adjustments which reflect that cancer risks are generally higher from early-life exposures than from similar exposures later in life:

- For exposures before 2 years of age (i.e., spanning a 2-year interval from the first day of birth up until a child's second birthday), a 10-fold adjustment.
- For exposures between 2 and < 16 years of age (i.e., spanning a 14-year time interval from a child's second birthday up until their sixteenth birthday), a 3-fold adjustment.
- For exposures after turning 16 years of age, no adjustment.

The adjustments were applied using the same method used by the USEPA in the development of the RSLs. Children were evaluated as two age groups, ages 0 to 2 years and ages 2 to 6 years; and adults were evaluated as two age groups, ages 6 to 16, and ages greater than 16 years old. Using this

approach the intakes for recreational users and hypothetical residents were calculated as follows:

$$Intake_{Child} = Intake_{(ages\ 0-2\ years)} \times 10 + Intake_{(ages\ 2-6\ years)} \times 3$$

$$Intake_{Adult} = Intake_{(ages\ 6-16\ years)} \times 3 + Intake_{(ages > 16\ years)}$$

The above approach was used only for those chemicals which are identified as mutagenic in the USEPA RSL table (e.g., benzo(a)pyrene and related compounds, hexavalent chromium). Sample calculations demonstrating this approach are included in Attachment 5.

4.0 TOXICITY ASSESSMENT

The toxicity assessment seeks to identify potential adverse health effects in exposed populations. Quantitative estimates of the relationship between the magnitude and type of exposures and the severity or probability of human health effects are defined for the identified constituents of concern. Quantitative toxicity values determined during this component of the risk assessment are integrated with exposure assessment outputs to characterize the potential occurrence of adverse health effects for each receptor group.

The reference dose (RfD) is the toxicity value used to evaluate non-carcinogenic health effects for ingestion and dermal exposures. The reference concentration (RfC) is used to evaluate non-carcinogenic health effects for inhalation exposures. The RfD and RfC estimate a daily exposure level for a human population that is unlikely to pose an appreciable risk during a portion or for all of a human lifetime. It is based on a review of animal and/or human toxicity data, with adjustments for various data uncertainties. Carcinogenic effects are quantified using the cancer slope factor (CSF) for ingestion and dermal exposures, and using inhalation unit risks (IURs) for inhalation exposure that are plausible upper-bound estimates of the probability of the development of cancer per unit intake of the chemical over a lifetime. These are typically based on dose-response data from human and/or animal studies.

4.1 TOXICITY CRITERIA FOR ORAL AND INHALATION EXPOSURES

Oral RfDs and CSFs and inhalation RfCs and IURs used in the HHRA were obtained from the following primary USEPA literature sources, selected per USEPA guidance (2003b):

- Integrated Risk Information System (IRIS).
- USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs) — The Office of Research and Development/National Center for Environmental Assessment (NCEA) Superfund Health Risk

Technical Support Center develops chemical-specific PPRTVs when requested by USEPA's Superfund program.

- Other toxicity values— These sources include, but are not limited to, California Environmental Protection Agency (Cal EPA) toxicity values, Agency for Toxic Substances and Disease Registry (ATSDR) values, and the Annual Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997).

Although toxicity criteria can be found in several toxicological sources, USEPA's IRIS online database is the preferred source of toxicity values. This database is continuously updated, and its values are verified by USEPA. The USEPA RSL table may also be used for toxicity criteria. This table is updated several times a year and reflects recent changes in IRIS. Tables E-16, E-17, E-18, and E-19 (RAGS Part D Tables 5.1, 5.2, 6.1, and 6.2) present RfDs, RfCs, CSFs, and IURs for the identified COPCs.

4.2 TOXICITY CRITERIA FOR DERMAL EXPOSURE

RfDs and CSFs in the scientific literature are typically expressed as "administered" (i.e., not absorbed) doses. Therefore, these values are considered inappropriate for estimating risks associated with dermal exposures. Oral dose-response parameters based on administered doses must be adjusted to absorbed doses before they can be compared to estimated dermal exposure intakes.

When oral absorption is essentially complete (i.e., 100 percent), an absorbed dose is equivalent to the administered dose, and therefore no toxicity adjustment is necessary. Conversely, when the gastrointestinal absorption of a chemical is poor (e.g., 1 percent), the absorbed dose is smaller than the administered dose; thus, toxicity factors based on absorbed dose should be adjusted to account for the difference in the absorbed dose relative to the administered dose. USEPA (2004a) recommends a 50 percent absorption cut-off to reflect the intrinsic variability in analyzing absorption studies. Therefore, the adjustment from administered to absorbed dose was only performed when the chemical-specific gastrointestinal absorption efficiency was less than 50 percent. The adjustment from administered to absorbed dose was made using chemical-specific gastrointestinal absorption efficiencies published in numerous sources of guidance (e.g., USEPA 2004a [the primary reference], IRIS, ATSDR toxicological profiles, etc.) using the following equations:

$$RfD_{dermal} = (RfD_{oral})(ABS_{GI})$$

$$CSF_{dermal} = (CSF_{oral}) / (ABS_{GI})$$

where:

ABS_{GI}	=	absorption efficiency in the gastrointestinal tract
RfD_{dermal}	=	reference dose for dermal exposures
RfD_{oral}	=	reference dose for oral exposures
CSF_{dermal}	=	cancer slope factor for dermal exposures
CSF_{oral}	=	cancer slope factor of oral exposures

As noted, the preceding adjustment of the oral toxicity criteria (i.e., RFDs, CSFs) is necessary so that the dermal route of exposure may be quantitatively evaluated in the baseline risk assessment. Further explanation of this procedure and its necessity are presented in Appendix A of USEPA RAGS Part A.

4.3 CHROMIUM TOXICITY

Toxicity criteria are available for different forms of chromium, which is considered more toxic in the hexavalent state. Chromium speciation was not performed for the soil and groundwater samples collected at the Atwater facility. Because available site history does not provide information about chromium speciation or use at the site, chromium was conservatively evaluated as hexavalent chromium in the HHRA.

4.4 TOXICITY CRITERIA FOR THE CARCINOGENIC EFFECTS OF PAHS

Limited toxicity values are available to evaluate the carcinogenic effects from exposure to carcinogenic PAHs. The most extensively studied carcinogenic PAH is benzo(a)pyrene, which is classified by USEPA as a probable human carcinogen. Although CSFs are available for benzo(a)pyrene, insufficient data are available to calculate CSFs for other carcinogenic PAHs. The toxic effects of these chemicals were evaluated using TEFs based on the potency of each compound relative to that of benzo(a)pyrene, as presented in current USEPA guidance (1993). TEFs are used to convert each individual carcinogenic PAH concentration into an equivalent concentration of benzo(a)pyrene.

4.5 EVALUATION OF CARCINOGENS THAT ACT THROUGH A MUTAGENIC MODE OF ACTION

USEPA's Guidelines for Carcinogen Risk Assessment (2005b) and Supplemental Guidance of Assessing Susceptibility from Early Life Exposure to Carcinogens (2005a) specifies the use of ADAFs for carcinogens that act via the mutagenic mode of action, including the carcinogenic PAHs and hexavalent chromium. No chemical-specific ADAFs have been derived for carcinogenic PAHs or hexavalent chromium; therefore, the following default ADAFs were used: 10 for ages 0-2, three for ages 2-16, and 1 (no adjustment) for ages 16-70. These ADAFs were used to evaluate exposures to carcinogenic PAHs

and hexavalent chromium for recreational users and hypothetical residents using the approach presented in Section 3.4.

5.0 RISK ESTIMATES

This section characterizes the potential human health risks associated with exposures to COPCs. Potential risks (non-carcinogenic and carcinogenic) for human receptors from exposures as outlined in the exposure assessment were quantitatively determined during the risk characterization component of this HHRA. Sections 5.1 and 5.2 outline the methods used to quantitatively estimate the type and magnitude of potential risks to human receptors. A summary of the risk characterization is provided in Section 5.3.

5.1 QUANTITATIVE ANALYSIS OF CONSTITUENTS

Quantitative estimates of risk for chemicals selected as COPCs were calculated according to risk assessment methods outlined in USEPA guidance (1989). Lifetime cancer risks are expressed in the form of dimensionless probabilities referred to as incremental lifetime cancer risks (ILCRs), based on CSFs and IURs. Non-carcinogenic risk estimates are presented in the form of hazard quotients (HQs), which are determined by comparing intakes to published RfDs and RfCs. ILCR estimates for ingestion and dermal exposures were generated for each COPC using estimated exposure intakes and published CSFs, as follows:

$$ILCR = (\text{Estimated Exposure Intake})(CSF)$$

If the equation above produces an ILCR greater than 0.01, the following equation is used:

$$ILCR = 1-[\exp(-\text{Estimated Exposure Intake})(CSF)]$$

ILCR estimates of inhalation exposures are generated for each COPC using estimated exposure concentrations and published IURs, as follows:

$$ILCR = (IUR)(\text{Exposure Concentration})(1000\ \mu g/mg)$$

An ILCR of 1×10^{-6} indicates that the exposed receptor has a one-in-one-million chance of developing cancer under the defined exposure scenario. Alternatively, such a risk may be interpreted as representing one additional case of cancer in an exposed population of one million persons.

Non-carcinogenic risks were assessed using the concept of HQs and hazard indices (HIs). The HQ for a COPC is the ratio of the estimated intake to the RfD and is calculated for ingestion and dermal exposures as follows:

$$HQ = (\text{Estimated Exposure Intake})/(RfD)$$

For inhalation exposures, the HQ is calculated as follows:

$$HQ = (\text{Exposure Concentration})/(RfC)$$

An HI was generated by summing the individual HQs for all COPCs. The HI is not a mathematical prediction of the severity of toxic effects and therefore is not a true "risk"; it is simply a numerical indicator of the possibility of the occurrence of non-carcinogenic (threshold) effects.

5.2 INTERPRETATION OF RISK ASSESSMENT RESULTS

To interpret the quantitative risk estimates and aid risk managers in determining the need for remediation, quantitative risk estimates are compared to typical USEPA risk benchmarks. Calculated ILCRs are interpreted using USEPA's target cancer risk range (1×10^{-4} to 1×10^{-6}) and MDEQ's target cancer risk level of 1×10^{-5}; HIs are evaluated using a value of 1.0.

USEPA defines the range of 1×10^{-4} to 1×10^{-6} as the ILCR target range for hazardous waste facilities addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). Individual or cumulative ILCRs greater than 1×10^{-4} are generally considered "unacceptable" by USEPA. Risk management decisions are necessary when the ILCR is within 1×10^{-4} to 1×10^{-6}. USEPA typically does not require remediation when the cumulative ILCR is less than 1×10^{-6}. Cancer risk estimates in this HHRA are also compared to the MDEQ target level of 1×10^{-5}.

An HI exceeding unity (1.0) indicates that non-carcinogenic health risks may be associated with exposure. If an HI exceeds unity, target organ effects associated with exposure to COPCs are considered. Only those HQs for chemicals affecting the same target organ(s) or exhibiting similar critical effect(s) are regarded as truly additive. Consequently, the cumulative HI could exceed 1.0, but no adverse health effects would be anticipated unless the COPCs affected the same target organ or exhibited the same critical effect (i.e., unless target organ/critical effect-specific HIs exceeded 1).

5.3 RISK CHARACTERIZATION RESULTS

This section summarizes the risk characterization for the Atwater facility. Cancer risk estimates and non-cancer hazard quotients for each contaminant and HIs for each pathway are shown in the RAGS Part D Tables 7.1 through 7.6 in Attachment 3, and Tables 9.1 through 9.8 in Attachment 3 present a summary of the non-cancer and cancer risks calculated for COPCs for all receptors. Sample calculations are presented in Attachment 5. A summary of risks for all receptors is presented in Table E-20.

5.3.1 NON-CANCER HAZARDS

Non-cancer total HIs were less than or equal to 1 for all receptors evaluated except for child and adult residents exposed to COPCs in groundwater (child HI = 5, adult HI = 3). Naphthalene (target organ: respiratory) via in the inhalation pathway was the primary contributor to this HI for both the adult and child residents. No adverse non-cancer effects are anticipated for any other receptors except the residents, and no adverse non-cancer effects are anticipated for exposures to soil by any receptor.

5.3.2 CANCER RISKS

Cancer risk estimates for construction workers, industrial workers, and child, adult, and lifelong recreational users are within USEPA's target cancer risk range of $1x10^{-4}$ to $1x10^{-6}$. Cancer risk estimates for adult residents exposed to COPCs in surface and subsurface soil and child residents exposed to COPCs in groundwater were also within USEPA's target cancer risk range. However, risk estimates for child and lifelong residents exposed to COPCs in surface and subsurface soil exceeded the USEPA risk range (ILCRs = $2x10^{-4}$ for both media and receptors) due primarily to the BAP equivalents, arsenic, and hexavalent chromium. The cancer risk estimate for lifelong residents exposed to COPCs in groundwater exceeded the target risk range (ILCR = $2x10^{-4}$) primarily due to arsenic and, to a lesser extent, BAP equivalents, naphthalene, and hexavalent chromium.

Surface soil cancer risk estimates for industrial workers (ILCR = $2x10^{-5}$), child recreational users (ILCR = $8x10^{-5}$), adult recreational users (ILCR = $2x10^{-5}$), lifelong recreational users (ILCR = $1x10^{-4}$), child residents (ILCR = $2x10^{-4}$), adult residents (ILCR = $3x10^{-5}$), and lifelong residents (ILCR = $2x10^{-4}$) exceed MDEQ's target cancer risk level of $1x10^{-5}$. The primary risk drivers are arsenic, BAP equivalents, and hexavalent chromium. Subsurface soil cancer risk estimates for industrial workers (ILCR = $2x10^{-5}$), child recreational users (ILCR = $7x10^{-5}$), lifelong recreational users (ILCR = $9x10^{-5}$), child residents (ILCR = $2x10^{-4}$), adult residents (ILCR = $3x10^{-5}$), and lifelong residents (ILCR = $2x10^{-4}$) exceed MDEQ's target risk level primarily due to BAP equivalents, arsenic, and hexavalent chromium. Groundwater cancer risk estimates exceed the MDEQ target risk level for the child resident (ILCR = $7x10^{-5}$) primarily due to arsenic, BAP equivalents, and hexavalent chromium and also exceed for the adult and lifelong residents

(ILCRs = $2x10^{-4}$ for each) primarily due to arsenic, naphthalene, BAP equivalents, and hexavalent chromium.

5.4 EVALUATION OF LEAD

Lead was selected as a COPC in both surface and subsurface soil. The maximum and mean concentrations of lead in surface and subsurface soil are presented below. The mean concentrations of lead in both surface and subsurface soil are less than the COPC screening level. Because the mean concentrations are less than 400 mg/kg, the IEUBK and the Adult Lead Model was not used to evaluate lead. However, the maximum concentration of lead in subsurface soil (detected at DASB109) is considerably greater than the next-greatest detection of 760 mg/kg (detected at DASB114). Lead concentrations detected in other samples used in this HHRA that were adjacent to DASB109 do not exceed 160 mg/kg.

Environmental medium	Maximum detected lead concentration	Arithmetic-mean lead concentration	COPC screening level[1]
Surface soil	970 mg/kg	267 mg/kg	400 mg/kg
Subsurface soil	2,400 mg/kg	300 mg/kg	400 mg/kg

1 - COPC screening levels are defined and referenced in Section 2.

5.5 VAPOR INTRUSION

There are currently no buildings within the study area. Consequently, this evaluation considered a hypothetical scenario where a residential or industrial building was constructed within the study area. Naphthalene in groundwater was the only chemical selected as a COPC for the vapor intrusion pathway. The maximum concentration of naphthalene (detected in DAMW02) was evaluated as the source concentration in the evaluation; therefore, risks and hazards for vapor intrusion from other well locations are expected to be less than from DAMW02. The soil at the site is sand and clay; therefore, the Soil Conservation Services (SCS) soil type of Sandy Clay (SC) was used in the evaluation. Based on the bottom depth indicated by available groundwater depth data, an average depth to groundwater of 4.5 feet (137 centimeters) was assumed.

The evaluation of the hypothetical future residential land use scenario assumed an exposure frequency of 350 days per year and exposure duration of 30 years. Default parameters were used for the remaining model input parameters. The evaluation of the hypothetical future industrial land use scenario assumed an exposure frequency of 250 days per year and exposure duration of 25 years (USEPA, December 2002b). The American Society for Testing and Materials (ASTM) (2004) default value of 0.83 hr^{-1} was used as the air exchange rate and 300 cm was used as the building height for the industrial scenario. The same input parameters used to evaluate residential exposures were used for the remaining input

parameters. Toxicity criteria for naphthalene presented in Tables E-17 and E-19 were used in the vapor intrusion evaluation.

The modeled outputs from the Johnson and Ettinger Vapor Intrusion Model are presented in Attachment 6 and are summarized in this section. The non-cancer hazard indices and cancer risks are compared to the same risk management target levels defined in Section 5.2.

Total HIs for residential and industrial exposures to the maximum concentration of naphthalene were less than the target HI of 1, indicating that adverse non-carcinogenic effects are not anticipated for these receptors under the defined exposure conditions.

The ILCRs for residential and industrial exposures for the maximum concentration of naphthalene were less than or within the USEPA target risk range of 10^{-4} to 10^{-6}. The total ILCRs were also less than MDEQ's target cancer risk level of 1×10^{-5}. Therefore, the results indicate that there is no significant risk from vapor intrusion.

6.0 UNCERTAINTIES

There are uncertainties associated with all HHRAs. This section summarizes these uncertainties, and discusses how they may affect the final risk numbers discussed in Section 6.0.

There is uncertainty associated with all steps of the risk assessment process. Uncertainty in the data evaluation is associated with sampling adequacy, the current status of the predictive databases for development of screening values, the procedures used to include or exclude constituents as chemicals of potential concern, and the methods used and the assumptions made to determine EPCs. The selection of COPCs is based on exposure assumptions and toxicity information, which in turn have associated uncertainties. Uncertainty associated with the exposure assessment includes the values used as input variables for a given intake route and the predictions regarding future land use and population characteristics. Uncertainty in the toxicity assessment includes the quality of the existing data to support dose-response relationships and the weight-of-evidence used for determining the carcinogenicity of COPCs. Uncertainty in risk characterization includes that associated with exposure to multiple chemicals and the cumulative uncertainty from combining conservative assumptions made in earlier activities.

While there are various sources of uncertainty (as described above) throughout the risk assessments, assumptions were made in this HHRA so that the final calculated risks would be conservative estimates that are protective of public health. Thus, the resultant uncertainty in the numerical risk assessments is in how much lower the actual risks are. Each uncertainty mentioned above is discussed below.

6.1 EXISTING DATABASES

Historical soil data that were not validated were not used in the risk assessment. Limited uncertainty is associated with the exclusion of the historical unvalidated data because the previous data were similar to the new validated data used in the HHRA in terms of magnitudes of concentrations of the detected chemicals. Because the soil data used in the risk assessment for USCG Atwater were validated, limited uncertainty is associated with the data because any data unreliable for use would have been qualified as rejected, "R," during validation. Data qualified as rejected (i.e., PAH data from select April 2010 samples) were excluded from the data set for risk assessment purposes. Locations with rejected PAH data were re-sampled in May 2011, and the re-sampled data were used in the HHRA. Results qualified as estimated, "J," during validation were included in the HHRA. Data qualified as estimated were utilized even though the reported positive concentrations or sample-specific quantitation limits may be somewhat imprecise. The use of estimated data adds to the uncertainty associated with the risk assessment, but the associated uncertainty is expected to be negligible compared to the other uncertainties inherent in the risk evaluation process (i.e., uncertainties with land uses, exposure scenarios, toxicological criteria, etc.). When determining exposure concentrations via statistical procedures (i.e., ProUCL), the detection limit was entered for chemicals that were not detected in accordance with USEPA guidance (USEPA, 2010a).

6.2 CHEMICALS POTENTIALLY ATTRIBUTABLE TO BACKGROUND

No chemicals were eliminated as COPCs on the basis of screening against background concentrations. State default background values developed by MDEQ are available. Site concentrations of COPCs exceed the State background values. However, total chromium (evaluated as hexavalent chromium) was a primary risk driver in soil, but the maximum concentrations of chromium in surface and subsurface soil (20 mg/kg and 19 mg/kg, respectively) only marginally exceed the State background value (18 mg/kg) for total chromium. The 95% UCLs calculated for chromium in both surface and subsurface soil (15.8 mg/kg and 15.9 mg/kg, respectively) do not exceed the State background value. Therefore, it is possible that the site total chromium values are reflective of background. Section 6.10 discusses risk estimates if it is assumed that total chromium is present as trivalent chromium instead of hexavalent chromium.

6.3 COPC SCREENING LEVELS

The use of risk-based screening levels based on conservative residential land use scenarios corresponding to an ILCR of $1x10^{-6}$ and HI of 0.1 for the USEPA RSLs should make certain that the significant contributors to risk from a site are evaluated. The elimination of chemicals that are present at concentrations that correspond to an ILCR less than $1x10^{-6}$ and an HI less than 0.1 should not affect the

final conclusions of the risk assessment because these chemicals are not expected to cause a potential health concern at the concentrations detected.

USEPA does not provide screening levels for the volatilization of chemicals from soils into the indoor air of a building. Therefore, only groundwater data were used in the evaluation of the vapor intrusion pathway because USEPA does provide relevant screening criteria. However, MDEQ does provide screening criteria for the volatilization of chemicals from soils to indoor air criteria. The surface and subsurface soil data used in this HHRA are compared to the MDEQ soil volatilization criteria in Tables E-21 and E-22, respectively. As the tables show, no chemicals in surface or subsurface soil exceed the MDEQ soil volatilization screening levels. Therefore, excluding the MDEQ soil volatilization values from the COPC selection in Section 2.0 does not add uncertainty to the risk assessment.

6.4 ABSENCE OF COPC SCREENING LEVELS

Risk-based screening levels are not currently available for several organic constituents detected in soil at USCG Atwater (i.e., benzo(g,h,i)perylene, phenanthrene, and acenaphthylene). The screening level available for pyrene were used as surrogate screening levels for benzo(g,h,i)perylene and phenanthrene, and the screening level available for acenaphthene was used for acenaphthylene because these compounds have similar chemical structures. The use of these surrogates may increase the uncertainty in the risk assessment. The direction of bias cannot be determined.

6.5 EXPOSURE POINT CONCENTRATIONS

Uncertainty is associated with the use of the 95 percent UCL on the mean concentration as the EPC. As a result of using the 95 percent UCL, the estimations of potential risk are most likely to be overestimated because this is a representation of the upper limit that potential receptors would be exposed to over the entire exposure period. Uncertainty is also introduced when the quantitation limit for non-detects is used as an input to ProUCL when calculating the EPC. This may either overestimate or underestimate the risks to potential receptors.

The maximum concentration was used as the EPC for groundwater because data from only four wells were available. Using the maximum concentration is notable particularly for naphthalene (a risk driver in groundwater) because the second-greatest naphthalene concentration detected (0.19 µg/L) is orders of magnitude less than the maximum concentration (120 µg/L), which was used for the evaluation.

6.6 LAND USE

Uncertainty and conservatism may be introduced into the risk assessment when estimated risks are projected for future land use patterns. The risks calculated in this HHRA are based in part on projected land use at the site. Current land use is industrial, but future land use may include recreational, commercial, or residential uses. For this reason, recreational and residential receptors were evaluated in the risk assessment along with construction workers and industrial users to be protective of any future use.

6.7 EXPOSURE PARAMETERS

Each exposure factor selected for use in the risk assessment contains some associated uncertainty. Generally, exposure factors are based on surveys of physiological and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally have a broad distribution. To avoid underestimation of exposure, USEPA guidelines (e.g., USEPA, 2004a) for the RME receptor were used, if applicable, which generally specify the use of the 95th percentile for most parameters. Therefore, the selected exposure factors for the RME receptor represent the upper bound of the observed or expected practices which are characteristic of the majority of the population.

Generally, uncertainty can be assessed for many assumptions made in determining factors for calculating exposures and intakes. Many of these parameters were determined from the statistical analyses of human population characteristics. Often, the database used to summarize a particular exposure parameter (i.e., body weight) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty. For many parameters for which limited information exists (e.g., dermal absorption), greater uncertainty exists. For example, current USEPA guidance (2004a) does not provide dermal absorption factors for exposure to most metals (except arsenic and cadmium). Therefore, there is some uncertainty due to evaluation of COPCs in soil for the dermal pathway.

Exposure parameters selected for the recreational users were conservative (e.g., an exposure frequency of 160 days per year, which assumes recreational users access the site 5 days per week for 8 months of the year). However, this assumption was made because future land use at the site is largely unknown and commercial use is a possible future land use. Because the residential receptor is the most conservative receptor and future land use could include residential use, the overall risk assessment conclusions are not affected by the exposure assumptions used for recreational users.

Uncertainty with vapor intrusion evaluated using the Johnson and Ettinger Model includes:

- There are currently no buildings at the site. Therefore, the vapor intrusion pathway is currently incomplete. Vapor intrusion was evaluated only for informational purposes in case future land use includes the construction of a building on the site.

- The model assumes that the areal extent of contamination is greater than that of the building floor in contact with the soil and that the contamination is homogeneously distributed within the zone of contamination. The groundwater concentrations from a single well were used as the exposure point concentrations for the model. It is not known if the extent of the groundwater plume is larger or smaller than the assumed building footprint.

- The model does not take into account transformation processes.

- The default building area of 10 meters (32.8 feet) by 10 meters for residential exposures is based on a Michigan study and corresponds to the 10th percentile floor space area for residential single family dwellings. The slab on grade scenario assumes a single floor dwelling 2.44 meters (8 feet) high for residential exposures and 3.0 meters (10 feet) for industrial exposures. The modeling results may be different for a building with different dimensions.

6.8 DERIVATION OF TOXICITY CRITERIA

Uncertainty associated with the toxicity assessment is associated with hazard assessment and dose-response evaluations for the COPCs. The hazard assessment deals with characterizing the nature and strength of the evidence of causation or the likelihood that a chemical that induces adverse effects in animals will also induce adverse effects in humans. Hazard assessment of carcinogenicity is evaluated as a weight-of-evidence determination, using the USEPA methods. Positive animal cancer test data suggest that humans contain tissue(s) that may manifest a carcinogenic response; however, the animal data cannot necessarily be used to predict the target tissue in humans. In the hazard assessment of non-cancer effects, however, positive animal data often suggest the nature of the effects (i.e., the target tissues and type of effects) anticipated in humans.

Uncertainty in hazard assessment arises from the nature and quality of the animal and human data. Uncertainty is reduced when: similar effects are observed across species, strain, sex, and exposure route; the magnitude of the response is clearly dose related; pharmacokinetic data indicate a similar fate in humans and animals; postulated mechanisms of toxicity are similar for humans and animals; and the chemical of concern is structurally similar to other chemicals for which the toxicity is more completely characterized.

Uncertainty in the dose-response evaluation includes the determination of a CSF for the carcinogenic assessment and derivation of an RfD for the non-carcinogenic assessment. Uncertainty is introduced from interspecies (animal to human) extrapolation which, in the absence of quantitative pharmacokinetic or mechanistic data, is usually based on consideration of interspecies differences in basal metabolic rate. Uncertainty also results from intraspecies variation. Most toxicity experiments are performed with animals that are very similar in age and genotype, so intragroup biological variation is minimal, but the human population of concern may reflect a great deal of heterogeneity including unusual sensitivity or tolerance to the COPC. Even toxicity data from human occupational exposures reflect a bias because only those individuals sufficiently healthy to attend work regularly (the "healthy worker effect") and those not unusually sensitive to the chemical are likely to be occupationally exposed. Finally, uncertainty arises from the quality of the key study from which the quantitative estimate is derived and the database. For cancer effects, the uncertainty associated with dose-response factors is mitigated by assuming the 95 percent upper bound for the CSF. Another source of uncertainty in carcinogenic assessment is the method by which data from high doses in animal studies are extrapolated to the dose range expected for environmentally exposed humans. The linearized multistage model, which is used in nearly all quantitative estimations of human risk from animal data, is based on a non-threshold assumption of carcinogenesis. Evidence suggests, however, that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are non-carcinogenic. Therefore, the use of the linearized multistage model is conservative for chemicals that exhibit a threshold for carcinogenicity.

For non-cancer effects, additional uncertainty factors may be applied in the derivation of the RfD to mitigate poor quality of the key study or gaps in the database. Additional uncertainty for non-cancer effects arises from the use of an effect level in the estimation of an RfD, because this estimation is predicated on the assumption of a threshold below which adverse effects are not expected. Therefore, an uncertainty factor is usually applied to estimate a no-effect level. Additional uncertainty arises in estimation of an RfD for chronic exposure from subchronic data. Unless empirical data indicate that effects do not worsen with increasing duration of exposure, an additional uncertainty factor is applied to the no-effect level in the subchronic study. Uncertainty in the derivation of RfDs is mitigated by the use of uncertainty and modifying factors that normally range between 3 and 10. The resulting combination of uncertainty and modifying factors may reach 1,000 or more.

The derivation of dermal RfDs and CSFs from oral values may cause uncertainty. This is particularly the case when chemical-specific gastrointestinal absorption rates are not available in the literature or when only qualitative statements regarding absorption are available.

6.9 USE OF CHRONIC TOXICITY VALUES FOR CONSTRUCTION WORKERS

Under the guidelines established by the Superfund program, exposures to construction workers of one year or less are classified as subchronic exposures. Risks for non-carcinogenic effects associated with subchronic exposures should incorporate toxicity values for subchronic and not chronic effects. Subchronic toxicity values are not as widely available as chronic values. Chronic toxicity values were used when subchronic toxicity values were not available. Using chronic toxicity criteria to evaluate subchronic exposures for construction workers tends to overestimate potential non-carcinogenic risks. However, construction worker hazards did not exceed the target level of 1; therefore, uncertainty due to the use of chronic toxicity values for construction workers does not affect overall risk assessment conclusions.

6.10 UNCERTAINTY IN THE TOXICITY CRITERIA FOR CHROMIUM

Chromium speciation data was not available; therefore, total chromium was assumed to be present as hexavalent chromium for purposes of risk characterization. Chromium (assumed to be present in the hexavalent state) was a risk driver in soil and groundwater in the HHRA. If total chromium had been assumed to be present in the trivalent state, chromium would not have been a COPC in any medium. Chromium in site soil is most likely representative of background conditions (see Section 7.2). Chromium in groundwater was a lesser risk driver compared to arsenic.

Table E-2 presents the risk estimates assuming trivalent chromium instead of hexavalent chromium is present at the site (in this case chromium would not be selected as a COPC). The following key differences are noted:

- The ILCR for the industrial worker exposed to chemicals in surface soil would still exceed the MDEQ target level (but would not exceed the USEPA target risk range) due to BAP equivalents and arsenic; however, the ILCR for exposure to chemicals in subsurface soil would not exceed MDEQ or USEPA target levels.
- The ILCR for the adult recreational user exposed to soil would no longer exceed the MDEQ target level. (The ILCR for this receptor exposed to subsurface soil does not exceed the MDEQ target level using either assumption about chromium).
- Risk estimates for child residents exposed to chemicals in surface soil and subsurface soil no longer exceed the USEPA target risk range if assuming chromium is present as trivalent chromium. The ILCRs for surface and subsurface soil still exceed the MDEQ target level.
- The ILCR for the lifelong resident exposed to COPCs in subsurface soil would no longer exceed the USEPA target risk range. The ILCR for subsurface soil would still exceed the MDEQ target

level, and the ILCR for surface soil would still exceed the USEPA target range and the MDEQ target level.

6.11 UNCERTAINTY IN THE RISK CHARACTERIZATION

Uncertainty in risk characterization results primarily from assumptions made regarding additivity of effects from exposure to multiple COPCs from various exposure routes. High uncertainty exists when summing cancer risks for several substances across different exposure pathways. This assumes that each substance has a similar effect and/or mode of action. Often compounds affect different organs, have different mechanisms of action, and differ in their fate in the body, so additivity may not be an appropriate assumption. However, the assumption of additivity is made to provide a conservative estimate of risk.

Finally, the risk characterization does not consider antagonistic or synergistic effects. Little or no information is available to determine the potential for antagonism or synergism for the COPCs. Therefore, the uncertainty regarding antagonistic or synergistic effects is ambiguous because potential human health risks may either be underestimated or overestimated.

7.0 SUMMARY AND CONCLUSIONS

The HHRA for the Atwater facility was conducted for future construction workers and hypothetical future residents exposed to chemicals in surface and subsurface soil and groundwater and for future industrial workers and recreational users exposed to chemicals in surface and subsurface soil. The following chemicals were selected as COPCs based on comparisons of maximum concentrations to conservative residential soil or drinking water screening criteria:

Surface soil:

BAP equivalents	Arsenic	Chromium
Copper	Lead	

Subsurface soil:

BAP equivalents	Arsenic	Chromium
Lead		

Groundwater:

2-Methylnaphthalene	BAP equivalents	Naphthalene
Arsenic	Chromium	

In addition, naphthalene in groundwater was selected as a COPC for the vapor intrusion pathway.

Cancer and non-cancer risk estimates were determined based on EPCs for surface soil, subsurface soil, and groundwater; intakes calculated using conservative exposure assumptions, and chemical-specific toxicity values. The following items summarize the key results of the HHRA:

- Estimated ILCRs were less than or within the USEPA target range of $1x10^{-4}$ to $1x10^{-6}$ for all receptors and exposure media except hypothetical child residents exposed to surface soil and subsurface soil, hypothetical adult residents exposed to groundwater, and hypothetical lifelong residents exposed to surface soil, subsurface soil and groundwater. BAP equivalents, hexavalent chromium, and arsenic were the primary risk drivers in surface soil and subsurface soil. Arsenic, naphthalene, hexavalent chromium, and BAP equivalents were the primary risk drivers in groundwater.

- Estimated ILCRs additionally exceeded the MDEQ target risk level of $1x10^{-5}$ for industrial workers exposed to surface soil and subsurface soil, child recreational users exposed to surface soil and subsurface soil, adult recreational users exposed to surface soil, lifelong recreational users exposed to surface and subsurface soil, and hypothetical child, adult, and lifelong residents exposed to surface soil, subsurface soil, and groundwater. For all of these receptors, the primary risk drivers for surface soil and subsurface soil are BAP equivalents, arsenic, and hexavalent chromium. The primary risk drivers for groundwater are arsenic, BAP equivalents, and hexavalent chromium for the child resident and arsenic, naphthalene, BAP equivalents, and hexavalent chromium for the adult and lifelong residents.

- The HIs estimated for groundwater for the hypothetical child and adult residents exceeded 1 on a target-organ specific basis due to naphthalene via the inhalation pathway.

- Average lead concentrations are less than the COPC screening level of 400 mg/kg in both surface and subsurface soil. Therefore, adverse effects are not anticipated due to lead in soil, and lead exposures were not modeled using the IEUBK model or Adult Lead Model.

- Vapor intrusion risks and hazards evaluated with the Johnson and Ettinger model were within the USEPA target cancer risk range and less than the MDEQ target risk level and less than an HI of 1, respectively. Therefore, no adverse effects are anticipated from vapor intrusion into potential future buildings.

Chemicals of concern (COCs) selected based on the USEPA target risk range of $1x10^{-4}$ to $1x10^{-6}$ and target HI of 1 are presented below.

Environmental Medium	Receptor	Chemical of Concern
Surface soil	Child[1] and Lifelong Residents	BAP equivalents, Arsenic, Chromium VI[3]
Subsurface soil	Child[1] and Lifelong[2] Residents	BAP equivalents, Arsenic, Chromium VI[3]
Groundwater	Child Residents	Naphthalene, 2-Methylnaphthalene
	Adult and Lifelong Residents	Arsenic[4], Naphthalene, 2-Methylnaphthalene, BAP equivalents[4], Chromium VI[3][4]

1 – No COCs are selected for the child resident exposed to surface soil or subsurface soil if using trivalent chromium toxicity criteria instead of hexavalent chromium toxicity criteria.

2 – No COCs are selected for the lifelong resident exposed to subsurface soil if using trivalent chromium toxicity criteria instead of hexavalent chromium toxicity criteria.

3 – It is unlikely that all chromium is present as hexavalent chromium. For example, assuming a one-to-six ratio of hexavalent chromium to trivalent chromium should be conservative for sites that are not considered to be hexavalent chromium sites. This is similar to methodology used to develop the USEPA air RSLs for hexavalent chromium, which were calculated using and the assumption of a one-to-six ratio of hexavalent chromium to trivalent chromium (USEPA, June 2011). Because available site history does not provide information about chromium speciation or use at the site, chromium was conservatively evaluated as hexavalent chromium. Total chromium would not be a COPC or a COC if using trivalent toxicity criteria instead of hexavalent toxicity criteria.

4 – The concentrations of arsenic and BAP equivalents in groundwater are less than the associated MCL; the concentrations of total chromium in groundwater are less than the MCL for total chromium.

BAP equivalents = benzo(a)pyrene equivalents

Chromium VI = hexavalent chromium

MCL = Maximum Contaminant Level

COCs selected based on the MDEQ target risk level of $1x10^{-5}$ and target HI of 1 are presented below.

Environmental Medium	Receptor	Chemical of Concern
Surface soil	Industrial Workers, Recreational Users (Child, Adult[2], and Lifelong), Residents (Child, Adult, and Lifelong)	BAP equivalents, Arsenic, Chromium VI[3]
Subsurface soil	Industrial Workers[1], Child and Lifelong Recreational Users, Residents (Child, Adult, and Lifelong)	BAP equivalents, Arsenic, Chromium VI[3]

Environmental Medium	Receptor	Chemical of Concern
Groundwater	Residents (Child, Adult, and Lifelong)	Arsenic[4], Naphthalene, 2-Methylnaphthalene, BAP equivalents[4], Chromium VI[3][4]

1 – No COCs are selected for the industrial worker exposed to subsurface soil if using trivalent chromium toxicity criteria instead of hexavalent chromium toxicity criteria.

2 – No COCs are selected for the adult recreational user exposed to surface soil if using trivalent chromium toxicity criteria instead of hexavalent chromium toxicity criteria.

3 – It is unlikely that all chromium is present as hexavalent chromium. For example, assuming a one-to-six ratio of hexavalent chromium to trivalent chromium should be conservative for sites that are not considered to be hexavalent chromium sites. This is similar to methodology used to develop the USEPA air RSLs for hexavalent chromium, which were calculated using and the assumption of a one-to-six ratio of hexavalent chromium to trivalent chromium (USEPA, June 2011). Because available site history does not provide information about chromium speciation or use at the site, chromium was conservatively evaluated as hexavalent chromium. Total chromium would not be a COPC or a COC if using trivalent toxicity criteria instead of hexavalent toxicity criteria.

4 – The concentrations of arsenic and BAP equivalents in groundwater are less than the associated MCL; the concentrations of total chromium in groundwater are less than the MCL for total chromium.

BAP equivalents = benzo(a)pyrene equivalents

Chromium VI = hexavalent chromium

MCL = Maximum Contaminant Level

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TABLE E-1
SURFACE SOIL SAMPLES USED IN HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Sample Number	Metals	Hg	PAHs
April 2010			
DA-SS-101-0002	x	x	x
DA-SS-102-0002*	x		
DA-SS-103-0002	x	x	x
DA-SS-104-0002*	x		
DA-SS-105-0002	x	x	x
DA-SS-106-0002*	x		
DA-SS-107-0002	x	x	x
DA-SS-108-0002	x	x	x
DA-SS-109-0002*	x		
DA-SS-110-0002*	x		
DA-SS-111-0002*	x		
DA-SS-112-0002*	x		
DA-SS-114-0002	x	x	x
DA-SS-115-0002*	x		
May 2011			
DA-SS-102A-0002		x	x
DA-SS-104A-0002		x	x
DA-SS-106A-0002		x	x
DA-SS-109A-0002		x	x
DA-SS-110A-0002		x	x
DA-SS-111A-0002		x	x
DA-SS-112A-0002		x	x
DA-SS-115A-0002		x	x

* - resampled.
x - analysis used in risk assessment.
Blank - not analyzed or data not used.
Hg - Mercury
PAHs - Polycyclic aromatic hydrocarbons

TABLE E-2
SUBSURFACE SOIL SAMPLES USED IN HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Sample Number	Metals	Hg	PAHs
April 2010			
DA-SB-101-0305	x	x	x
DA-SB-102-0305*	x		
DA-SB-103-0305	x	x	x
DA-SB-104-0305*	x		
DA-SB-105-0305	x	x	x
DA-SB-106-0305*	x		
DA-SB-107-0204	x	x	x
DA-SB-108-0305	x	x	x
DA-SB-109-0305*	x		
DA-SB-110-0305*	x		
DA-SB-111-0305*	x		
DA-SB-112-0305*	x		
DA-SB-114-0305	x	x	x
DA-SB-115-0305*	x		
May 2011			
DA-SB-102A-0406		x	x
DA-SB-104A-0204		x	x
DA-SB-106A-0204		x	x
DA-SB-109A-0204		x	x
DA-SB-110A-0305		x	x
DA-SB-111A-0305		x	x
DA-SB-112A-0204		x	x
DA-SB-115A-0204		x	x

* - resampled.
x - analysis to be used risk assessment.
Blank - not analyzed or data not used.
Hg - Mercury
PAHs - Polycyclic aromatic hydrocarbons

TABLE E-3
GROUNDWATER SAMPLES USED IN HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Sample Number	Metals	Dissolved Metals	PAHs
June 2011			
DA-GW-01-062011	x	x	x
DA-GW-02-062011	x	x	x
DA-GW-03-062011	x	x	x
DA-GW-04-062011	x	x	x

x - analysis used in risk assessment.
PAHs - Polycyclic aromatic hydrocarbons

TABLE E-4
SCREENING CRITERIA FOR SOIL
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

CAS No.	Chemical	USEPA Regional Screening Level for Residential Soil[1] (mg/kg)		MDEQ Direct Contact Criterion for Residential Soil[2] (mg/kg)
Metals				
7440-38-2	ARSENIC	0.39	C	7.6
7440-39-3	BARIUM	15000	N	37000
7440-43-9	CADMIUM	70	N	550
7440-47-3	CHROMIUM	0.29	C[3]	2500 [3]
7440-50-8	COPPER	3100	N	20000
7439-92-1	LEAD	400		400
7439-97-6	MERCURY	23	N[4]	160
7782-49-2	SELENIUM	390	N	2600
7440-22-4	SILVER	390	N	2500
7440-66-6	ZINC	23000	N	170000
Polycyclic Aromatic Hydrocarbons				
91-57-6	2-METHYLNAPHTHALENE	310	N	8100
83-32-9	ACENAPHTHENE	3400	N	41000
208-96-8	ACENAPHTHYLENE[5]	3400	N[5]	1600
120-12-7	ANTHRACENE	17000	N	230000
--	BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2
56-55-3	BENZO(A)ANTHRACENE	0.15	C	20
50-32-8	BENZO(A)PYRENE	0.015	C	2
205-99-2	BENZO(B)FLUORANTHENE	0.15	C	20
191-24-2	BENZO(G,H,I)PERYLENE	1700	N[6]	2500
207-08-9	BENZO(K)FLUORANTHENE	1.5	C	200
218-01-9	CHRYSENE	15	C	2000
53-70-3	DIBENZO(A,H)ANTHRACENE	0.015	C	2
206-44-0	FLUORANTHENE	2300	N	46000
86-73-7	FLUORENE	2300	N	27000
193-39-5	INDENO(1,2,3-CD)PYRENE	0.15	C	20
91-20-3	NAPHTHALENE	3.6	C	16000
85-01-8	PHENANTHRENE	1700	N[6]	1600
129-00-0	PYRENE	1700	N	29000

Notes:
1 - USEPA Regional Screening Level (RSL) for Residential Soil (June 2011). Values are based on an incremental lifetime cancer risk of 1x10-6 for carcinogens (C) or a hazard quotient of 1 for noncarcinogens (N).
2 - Michigan Department of Environmental Quality (MDEQ) Residential Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of 1x10-5 or a hazard quotient of 1.
3 - Critiera for hexavalent chromium were used for total chromium.
4 - The USEPA RSL is for mercuric chloride (and other mercury salts).
5 - The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.
6 - The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

CAS = Chemical Abstract Service

TA[illegible]S
SCREENING CRITERIA FOR GROUNDWATER
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

CAS No.	Chemical	USEPA Regional Screening Level for Tap Water[1] (µg/L)	MDEQ Residential Drinking Water Criterion[2] (µg/L)	USEPA MCL[3] (µg/L)	Groundwater Volatilization Criterion[4] (µg/L)	MDEQ Residential Volatilization to Indoor Air Criterion[5] (µg/L)
Metals						
7440-38-2	ARSENIC	0.045 C	10	10	NA	NA
7440-39-3	BARIUM	7300 N	2000	2000	NA	NA
7440-47-3	CHROMIUM	0.043 C[6]	100 [6]	100	NA	NA
7440-50-8	COPPER	1500 N	1000	1300	NA	NA
7439-92-1	LEAD	NA	4	15	NA	NA
7782-49-2	SELENIUM	180 N	50	50	NA	NA
7440-66-6	ZINC	11000 N	2400	NA	NA	NA
Polycyclic Aromatic Hydrocarbons						
91-57-6	2-METHYLNAPHTHALENE	150 N	260	NA	NA	NA
83-32-9	ACENAPHTHENE	2200 N	1300	NA	NA	4200
208-96-8	ACENAPHTHYLENE	2200 N[7]	52	NA	NA	3900
120-12-7	ANTHRACENE	11000 N	43	NA	NA	43
56-55-3	BENZO(A)ANTHRACENE	0.029 C	2.1	NA	NA	NA
--	BENZO(A)PYRENE EQUIVALENTS	0.0029 C	5	0.2	NA	NA
207-08-9	BENZO(K)FLUORANTHENE	0.29 C	0.8	NA	NA	NA
218-01-9	CHRYSENE	2.9 C	1.6	NA	NA	NA
206-44-0	FLUORANTHENE	1500 N	210	NA	NA	210
86-73-7	FLUORENE	1500 N	880	NA	NA	2000
91-20-3	NAPHTHALENE	0.14 C	520	NA	4 C	31000
85-01-8	PHENANTHRENE	1100 N[8]	52	NA	NA	1000
129-00-0	PYRENE	1100 N	140	NA	NA	140

Notes:

1 - USEPA Regional Screening Level (RSL) for Tap Water (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ for carcinogens (C) or a hazard quotient of 1 for non-carcinogens (N).

2 - Michigan Department of Environmental Quality (MDEQ) Residential Groundwater Generic Cleanup Criteria (Jaunary 23, 2006). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.

3 - 2011 Edition of the Drinking Water Standards and Health Advisories (USEPA, January 2011).

4 - Calculated using USEPA's Vapor Intrusion Screening Level (VISL) Calculator (USEPA, May 2012), May 2012 RSLs. Values correspond to a target cancer risk level of $1x10^{-6}$ or hazard quotient of 1 and an attenuation factor of 0.001.

5 - Michigan Department of Environmental Quality (MDEQ) Residential Volatilization to Indoor Air Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.

6 - Critiera for hexavalent chromium were used for total chromium.

7 - The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.

8 - The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

CAS = Chemical Abstract Service
MCL = Maximum Contaminant Level
NA = Not available/not applicable

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	djusted USEPA sidential RSL[5]	MDEQ Residential Generic Cleanup Criterion[6]	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
	METALS					
	7440-38-2	Arsenic	0.39 C	7.6	Yes	ASL
	7440-39-3	Barium	1500 N	37000	No	BSL
	7440-43-9	Cadmium	7 N	550	No	BSL
	7440-47-3	Chromium	0.29 C[8]	2500 [8]	Yes	ASL
	7440-50-8	Copper	310 N	20000	Yes	ASL
	7439-92-1	Lead	400	400	Yes	ASL
	7439-97-6	Mercury	2.3 N[9]	160	No	BSL
	7782-49-2	Selenium	39 N	2600	No	BSL
	7440-22-4	Silver	39 N	2500	No	BSL
	7440-66-6	Zinc	2300 N	170000	No	BSL
	POLYCYCLIC AROMATIC HYDROCAF					
	91-57-6	2-Methylnaphthalene	31 N	8100	No	BSL
	83-32-9	Acenaphthene	340 N	41000	No	BSL
	208-96-8	Acenaphthylene	340 N[10]	1600	No	BSL
	120-12-7	Anthracene	1700 N	230000	No	BSL
	56-55-3	Benzo(a)anthracene	0.15 C	20	Yes	ASL
	50-32-8	Benzo(a)pyrene	0.015 C	2	Yes	ASL
	--	Benzo(a)pyrene Equivale	0.015 C	2	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	0.15 C	20	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	170 N[11]	2500	No	BSL
	207-08-9	Benzo(k)fluoranthene	1.5 C	200	Yes	ASL
	218-01-9	Chrysene	15 C	2000	No	BSL
	53-70-3	Dibenzo(a,h)anthracene	0.015 C	2	Yes	ASL
	206-44-0	Fluoranthene	230 N	46000	No	BSL
	86-73-7	Fluorene	230 N	27000	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.15 C	20	Yes	ASL
	91-20-3	Naphthalene	3.6 C	16000	No	BSL
	85-01-8	Phenanthrene	170 N[11]	1600	No	BSL
	129-00-0	Pyrene	170 N	29000	No	BSL

Footnotes:

1 - Sample and duplicate are considered as two separate
2 - Values presented are sample-specific quantitation limit
3 - The maximum detected concentration is used for scre
4 - No site background data are available. Background da
5 - Adjusted USEPA Regional Screening Level (RSL) for F
6 - Michigan Department of Environmental Quality (MDEC
7 - The chemical is selected as a COPC if the maximum d
8 - Critiera for hexavalent chromium were used for total ch
9 - The USEPA RSL is for mercuric chloride (and other m
10 - The USEPA RSL for acenaphthene was used as a su
11 - The USEPA RSL for pyrene was used as a surrogate

Shaded criterion indicates that the maximum detected con
chemical was retained as a COPC.

Definitions:

C = Carcinogen
COPC = Chemical of potential concern
J = Estimated value
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:

For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below screening level

Associated Samples:

DASS101-0002
DASS102-0002
DASS102A-0002
DASS102A-0002-D
DASS103-0002
DASS104-0002
DASS104A-0002
DASS105-0002
DASS106-0002
DASS106A-0002
DASS107-0002
DASS108-0002
DASS109-0002
DASS109-0002-D
DASS109A-0002
DASS110-0002
DASS110A-0002
DASS111-0002

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Adjusted USEPA Residential RSL[5]	MDEQ Residential Generic Cleanup Criterion[6]	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
	METALS					
	7440-38-2	Arsenic	0.39 C	8	Yes	ASL
	7440-39-3	Barium	1500 N	37000	No	BSL
	7440-43-9	Cadmium	7 N	550	No	BSL
	7440-47-3	Chromium	0.29 C[8]	2500 [8]	Yes	ASL
	7440-50-8	Copper	310 N	20000	No	BSL
	7439-92-1	Lead	400	400	Yes	ASL
	7439-97-6	Mercury	2.3 N[9]	160	No	BSL
	7782-49-2	Selenium	39 N	2600	No	BSL
	7440-22-4	Silver	39 N	2500	No	BSL
	7440-66-6	Zinc	2300 N	170000	No	BSL
	POLYCYCLIC AROMATIC HYDROCARB					
	91-57-6	2-Methylnaphthalene	31 N	8100	No	BSL
	83-32-9	Acenaphthene	340 N	41000	No	BSL
	208-96-8	Acenaphthylene	340 N[10]	41000	No	BSL
	120-12-7	Anthracene	1700 N	230000	No	BSL
	--	Benzo(a)pyrene Equivalent	0.15 C	20	Yes	ASL
	56-55-3	Benzo(a)anthracene	0.15 C	20	Yes	ASL
	50-32-8	Benzo(a)pyrene	0.015 C	2	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	0.15 C	20	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	170 N[11]	29000	No	BSL
	207-08-9	Benzo(k)fluoranthene	1.5 C	200	No	BSL
	218-01-9	Chrysene	15 C	2000	No	BSL
	53-70-3	Dibenzo(a,h)anthracene	0.015 C	2	Yes	ASL
	206-44-0	Fluoranthene	230 N	46000	No	BSL
	86-73-7	Fluorene	230 N	27000	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.15 C	20	Yes	ASL
	91-20-3	Naphthalene	3.6 C	16000	No	BSL
	85-01-8	Phenanthrene	170 N[11]	29000	No	BSL
	129-00-0	Pyrene	170 N	29000	No	BSL

Footnotes:

1 - Sample and duplicate are considered as two separate sa
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screeni
4 - No site background data are available. Background data
5 - Adjusted USEPA Regional Screening Level (RSL) for Re
6 - Michigan Department of Environmental Quality (MDEQ) I
7 - The chemical is selected as a COPC if the maximum det
8 - Critiera for hexavalent chromium were used for total chrc
9 - The USEPA RSL is for mercuric chloride (and other merc
10 - The USEPA RSL for acenaphthene was used as a surr
11 - The USEPA RSL for pyrene was used as a surrogate fc

Definitions:

C = Carcinogen
COPC = Chemical of potential concern
J = Estimated value
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:

For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below screening level

Shaded criterion indicates that the maximum detected conc
chemical was retained as a COPC.

Associated Samples:

DASB101-0305	DASB106-0305
DASB102-0305	DASB106A-0204
DASB102A-0406	DASB107-0204
DASB102A-0406-D	DASB108-0305
DASB103-0305	DASB109-0305
DASB104-0305	DASB109A-0204
DASB104A-0204	DASB110-0305
DASB105-0305	DASB110A-0305

Scenario Timeframe:
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	MDEQ Residential Drinking Water Criterion[6]	USEPA MCL[7]	COPC Flag	Rationale for Contaminant Deletion or Selection[8]
	METALS					
	7440-38-2	Arsenic	10	10	Yes	ASL
	7440-39-3	Barium	2000	2000	No	BSL
	7440-47-3	Chromium	100 [9]	100 [9]	Yes	ASL
	7440-50-8	Copper	1000	1300	No	BSL
	7439-92-1	Lead	4	15	No	BSL
	7782-49-2	Selenium	50	50	No	BSL
	7440-66-6	Zinc	2400	NA	No	BSL
	DISSOLVED METALS					
	7440-38-2	Arsenic	10	10	Yes	ASL
	7440-39-3	Barium	2000	2000	No	BSL
	7440-47-3	Chromium	100 [9]	100	Yes	ASL
	7440-50-8	Copper	1000	1300	No	BSL
	7439-92-1	Lead	4	15	No	BSL
	7440-66-6	Zinc	2400	NA	No	BSL
	POLYCYCLIC AROMATIC HYDROCARBO					
	91-57-6	2-Methylnaphthalene	260	NA	Yes	ASL
	83-32-9	Acenaphthene	1300	NA	No	BSL
	208-96-8	Acenaphthylene	52	NA	No	BSL
	120-12-7	Anthracene	43	NA	No	BSL
	56-55-3	Benzo(a)anthracene	2.1	NA	Yes	ASL
	--	Benzo(a)pyrene Equivalents	5	0.2	Yes	ASL
	207-08-9	Benzo(k)fluoranthene	0.8	NA	No	BSL
	218-01-9	Chrysene	1.6	NA	No	BSL
	206-44-0	Fluoranthene	210	NA	No	BSL
	86-73-7	Fluorene	880	NA	No	BSL
	91-20-3	Naphthalene	520	NA	Yes	ASL
	85-01-8	Phenanthrene	52	NA	No	BSL
	129-00-0	Pyrene	140	NA	No	BSL

Footnotes:

1 - Sample and duplicate are considered as two separate sam
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screenin
4 - No background data are available for groundwater.
5 - Adjusted USEPA Regional Screening Level (RSL) for Tap V
6 - Michigan Department of Environmental Quality (MDEQ) Re
7 - 2011 Edition of the Drinking Water Standards and Health A
8 - The chemical is selected as a COPC if the maximum detec
9 - Critiera for hexavalent chromium were used for total chromi
10 - The USEPA RSL for acenaphthene was used as a surrog
11 - The USEPA RSL for pyrene was used as a surrogate for p

Shaded criterion indicates that the maximum detected concent
chemical was retained as a COPC.

initions:

Carcinogen
PC = Chemical of potential concern
Estimated value
Noncarcinogen
= Not applicable/not available

ionale Codes:

selection as a COPC:
L = Above screening level

elimination as a COPC:
L = Below COPC Screening Level

Associated Samples:
DA-GW-01-062011
DA-GW-02-062011
DA-GW-03-062011
DA-GW-03-062011-D
DA-GW-04-062011

OC IDOOR AIR

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Adjusted Groundwater Volatilization Criterion[5]	MDEQ Residential Volatilization to Indoor Air Criterion[6]	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
	METALS					
	7440-38-2	Arsenic	NA	NA	No	NTX
	7440-39-3	Barium	NA	NA	No	NTX
	7440-47-3	Chromium	NA	NA	No	NTX
	7440-50-8	Copper	NA	NA	No	NTX
	7439-92-1	Lead	NA	NA	No	NTX
	7782-49-2	Selenium	NA	NA	No	NTX
	7440-66-6	Zinc	NA	NA	No	NTX
	DISSOLVED METALS					
	7440-38-2	Arsenic	NA	NA	No	NTX
	7440-39-3	Barium	NA	NA	No	NTX
	7440-47-3	Chromium	NA	NA	No	NTX
	7440-50-8	Copper	NA	NA	No	NTX
	7439-92-1	Lead	NA	NA	No	NTX
	7440-66-6	Zinc	NA	NA	No	NTX
	POLYCYCLIC AROMATIC HYDROCAR					
	91-57-6	2-Methylnaphthalene	NA	NA	No	NTX
	83-32-9	Acenaphthene	NA	4200	No	BSL
	208-96-8	Acenaphthylene	NA	3900	No	BSL
	120-12-7	Anthracene	NA	43	No	BSL
	56-55-3	Benzo(a)anthracene	NA	NA	No	NTX
	--	Benzo(a)pyrene Equivalent	NA	NA	No	NTX
	207-08-9	Benzo(k)fluoranthene	NA	NA	No	NTX
	218-01-9	Chrysene	NA	NA	No	NTX
	206-44-0	Fluoranthene	NA	210	No	BSL
	86-73-7	Fluorene	NA	2000	No	BSL
	91-20-3	**Naphthalene**	**4 C**	31000	**Yes**	ASL
	85-01-8	Phenanthrene	NA	1000	No	NTX
	129-00-0	Pyrene	NA	140	No	NTX

Footnotes:

1 - Sample and duplicate are considered as two separate
2 - Values presented are sample-specific quantitation limi
3 - The maximum detected concentration is used for scre
4 - No background data are available for groundwater.
5 - Calculated using USEPA's Vapor Intrusion Screening
Adjusted values correspond to a target cancer risk lev
6 - Michigan Department of Environmental Quality (MDE
of $1x10^{-5}$ or a hazard quotient of 1.
7 - The chemical is selected as a COPC if the maximum
Shaded criterion indicates that the maximum detected co
chemical was retained as a COPC.

efinitions:

= Carcinogen
OPC = Chemical of potential concern
= Estimated value
= Noncarcinogen
A = Not applicable/not available

ationale Codes:

or selection as a COPC:
ASL = Above screening level

or elimination as a COPC:
BSL = Below COPC Screening Level
NTX = No toxicity criterion

OUTDOOR AIR

Associated Samples:
DA-GW-01-062011
DA-GW-02-062011
DA-GW-03-062011
DA-GW-03-062011-D
DA-GW-04-062011

TABLE E-10
CHEMICALS RETAINED AS COPCs
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Parameter	Surface Soil	Subsurface Soil	Groundwater	
	Direct Contact	Direct Contact	Direct Contact	Vapor Intrusion
Polycyclic Aromatic Hydrocarbons				
2-Methylnaphthalene			X	
Benzo(a)anthracene	X	X	X	
Benzo(a)pyrene	X	X		
Benzo(a)pyrene Equivalents	X	X	X	
Benzo(b)fluoranthene	X	X		
Benzo(k)fluoranthene	X			
Dibenzo(a,h)anthracene	X	X		
Indeno(1,2,3-cd)pyrene	X	X		
Naphthalene			X	X
Inorganics				
Arsenic	X	X	X	
Chromium	X	X	X	
Copper	X			
Lead	X	X		

Notes
X - Chemical was retained as a chemical of potential concern (COPC).

TABLE E-11
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs in surface soil during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Ingestion	Quant	Industrial workers may contact surface soil while at the site.
						Dermal	Quant	
				Recreational Users	Child	Ingestion	Quant	Recreational users may be exposed to COPCs in surface soil while at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents may be exposed to COPCs in surface soil while living at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
		Air	USCG Atwater	Construction Workers	Adult	Inhalation	Quant	Construction workers may be exposed to COPCs in fuguitive dust/volatile emissions from surface soil during excavation activities.
				Industrial Workers	Adult	Inhalation	Quant	Industrial workers may be exposed to COPCs in fuguitive dust/volatile emissions from surface soil while at the site.
				Recreational Users	Child	Inhalation	Quant	Recreational users may be exposed to COPCs in fugitive dust/volatile emissions from surface soil while at the site.
					Adult	Inhalation	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents may be exposed to COPCs in fugitive dust/volatile emissions from surface soil while living at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
	Subsurface Soil	Subsurface Soil	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs in subsurface soil during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Ingestion	Quant	Although exposures to subsurface soil by industrial workers are considered unlikely at the site, this scenario was included to aid in future risk management decisions.
						Dermal	Quant	
				Recreational Users	Child	Ingestion	Quant	Recreational users are not expected to be exposed to subsurface soil; however, this scenario is included to aid in future risk-management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents are not expected to be exposed to COPCs in subsurface soil; however, this scenario is included to aid in future risk-management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	

TABLE E-11
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 2 OF 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface Soil	Air	USCG Atwater	Construction Workers	Adult	Inhalation	Quant	Construction workers may be exposed to COPCs in fuguitive dust/volatile emissions from subsurface soil during excavation activities.
				Industrial Workers	Adult	Inhalation	Quant	Although exposures to subsurface soil by industrial workers are considered unlikely at the site, this scenario was included to aid in future risk management decisions.
				Recreational Users	Child	Inhalation	Quant	Recreational users are not expected to be exposed to subsurface soil; however, this scenario is included to aid in future risk-management decisions.
					Adult	Inhalation	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents are not expected to be exposed to subsurface soil; however, this scenario is included to aid in future risk-management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
	Groundwater	Groundwater	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs in groundwater during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Ingestion	None	Industrial workers are not expected to have contact with groundwater.
						Dermal	None	
				Recreational Users	Child	Ingestion	None	Recreational users are not expected to have contact with groundwater.
						Dermal	None	
					Adult	Ingestion	None	
						Dermal	None	
				Residents	Child	Ingestion	Quant	Hypothetical residents may be exposed to COPCs in groundwater while living at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
		Air	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs that have volatilized from groundwater during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Inhalation	None	Industrial workers are not expected to be exposed to COPCs that have volatilized from groundwater.
				Recreational Users	Child	Ingestion	None	Recreational users are not expected to be exposed to COPCs that have volatilized from groundwater.
						Dermal	None	
					Adult	Ingestion	None	
						Dermal	None	
				Residents	Adult	Inhalation	Quant	Hypothetical residents may be exposed to COPCs that have volatilized from groundwater while living at the site.
			Vapor Intrusion	Industrial Workers	Adult	Inhalation	Quant	Industrial workers may be exposed to COPCs that have volatilized from groundwater and migrated through building foundations into indoor air.
				Residents	Child	Inhalation	Quant	Hypothetical residents may be exposed to COPCs that have volatilized groundwater and migrated through building foundations into indoor air.
					Adult	Inhalation	Quant	

Notes:
COPC - Chemical of potential concern.
Quant - Quantitative.
Qual - Qualitative.

TABLE E-12
EXPOSURE POINT CONCENTRATION SUMMARY
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Surface Soil (mg/kg)		Subsurface Soil (mg/kg)		Groundwater (ug/L)	
	Maximum	95% UCL	Maximum	95% UCL	Maximum	95% UCL
Polycyclic Aromatic Hydrocarbons						
2-Methylnaphthalene	NA	NA	NA	NA	24	24[1]
Benzo(a)pyrene Equivalents	4.2	2.0[2]	3.3	1.6[2]	0.029	0.029[1]
Naphthalene	NA	NA	NA	NA	120	120[1]
Inorganics						
Arsenic	19	10.0[2]	17	10.4[2]	6.2	6.2[1]
Chromium	20	15.8[3]	19	15.9[3]	0.36	0.36[1]
Copper	620	213[2]	NA	NA	NA	NA
Lead	970	267[4]	2,400	300[4]	NA	NA

Notes:

1 - Maximum detected concentration
2 - 95% Approximate Gamma UCL
3 - 95% Student's t UCL
4 - Arithmetic mean concentration
COPC = Chemical of potential concern
NA - Not applicable. Not a COPC for this medium.
UCL = Upper confidence limit

RAGS Part D tables for exposure point concentrations and ProUCL printouts are included in Attachment 2.

TABLE E-13
EXPOSURE ASSUMPTION SUMMARY (REASONABLE MAXIMUM EXPOSURES)
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Exposure Parameter	Construction Worker	Industrial Worker	Recreational Users		Future On-Property Resident	
			Child	Adult	Child	Adult
All Exposures						
C_{soil} (mg/kg)	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]	Maximum or 95% UCL[1]
ED (years)	1[2]	25[3]	6[4]	24[4]	6[6]	24[6]
BW (kg)	70[5]	70[5]	15[4]	70[4]	15[5]	70[5]
AT_n (days)	ED x 365[5]	ED x 365[5]	ED x 365[5]	ED x 365[5]	ED x 365[5]	ED x 365[5]
AT_c (days)	25550[5]	25550[5]	25550[5]	25550[5]	25550[5]	25550[5]
Incidental Ingestion/Dermal Contact with Soil						
IR (mg/day)	330[3]	100[3]	200[4]	100[4]	200[6]	100[6]
EF-Soil (days/year)	250[2]	250[3]	160[2][7]	160[2][7]	350[6]	350[6]
FI (unitless)	1[2]	1[3]	1[4]	1[4]	1[6]	1[6]
SA (cm^2)	3300[3]	3300[8]	2800[4]	5700[4]	2800[8]	5700[8]
AF (mg/cm^2-event)	0.3[3]	0.2[8]	0.2[4]	0.07[4]	0.2[8]	0.07[8]
EV (events/day)	1[3]	1[8]	1[8]	1[8]	1[8]	1[8]
ABS (unitless)	Chemical Specific	Chemical Specific	Chemical Specific	Chemical Specific	Chemical Specific	Chemical Specific
CF (kg/mg)	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06
Inhalation Fugitive Dust/Volatile Emissions from Soil						
$C_{soil/air}$ (mg/m^3)	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated
ET (hours/day)	8[2]	8[2]	4[7]	4[7]	24[6]	24[6]
PEF (m^3/kg)	1.43E+06[3]	9.50E+08[9]	9.50E+08[9]	9.50E+08[9]	9.50E+08[9]	9.50E+08[9]
Ingestion/Dermal Contact with Groundwater						
IR (L/day)	0.01[2]	-	-	-	1[6]	2[6]
EF (days/year)	90[2]	-	-	-	350[6]	350[6]
ET (hours/day) and t_{event}	4[2]	-	-	-	1[8]	0.58[8]
EV (events/day)	1[2]	-	-	-	1[8]	1[8]
SA (cm^2)	3,300[8]	-	-	-	6,600[8]	18,000[8]
K_p (cm/hour)	Chemical Specific	-	-	-	Chemical Specific	Chemical Specific
t^* (hour/event), τ (hour),	Chemical Specific	-	-	-	Chemical Specific	Chemical Specific
CF (L/cm^3)	1E-03	-	-	-	1E-03	1E-03
Inhalation of Volatiles from Groundwater						
C_{air} (mg/m^3)	Calculated	-	-	-	Calculated	Calculated
ET (hours/day)	4[2]	-	-	-	1[2]	1[2]
EF (days/year)	90[2]	-	-	-	350[6]	350[6]
VF (L/m^3)	Calculated[10]	-	-	-	Calculated[11]	Calculated[11]

Notes:

ABS Absorption factor
AF Soil-to-skin adherence factor
AT_c Averaging time for carcinogenic effects
AT_n Averaging time for noncarcinogenic effects
BW Body weight
CF Conversion factor
$C_{soil/air}$ Exposure concentration for soil/air
ED Exposure duration

1 - USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
2 - Professional judgment (see text).
3 - USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
4 - Assumed same as resident.
5 - USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
6 - USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.
7 - Recreational users' exposure frequency and time on site are assumed 5 days per week for the warm weather months (8 months per year) and 4 hours per day.
8 - USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, EPA/540/R/99/005.
9 - USEPA, 2010: Soil Screening Guidance calculation Internet site at http://risk.lsd.ornl.gov/calc_start.htm. Site-specific values for Cleveland, OH.
10 - VDEQ, 2007: Virginia Department of Environmental Quality (VDEQ, online- http://www.deq.state.va.us/vrprisk/homepage.html).
11 - Foster, S.A. and P.C. Chrostowski, 1987. Inhalation Exposure to Volatile Organic Contaminants in the Shower.

TABLE E-14
INTERMEDIATE VARIABLES FOR CALCULATING DA(EVENT)
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Media	Dermal Absorption Fraction (soil)	FA	Kp		T(event)		Tau		T*		B
			Value	Value	Units	Value	Units	Value	Units	Value	Units	Value
Polycyclic Aromatic Hydrocarbons												
2-Methylnaphthalene	Groundwater	NA	1	8.9E-02	cm/hr	(1)	hr	6.6E-01	hr	1.6E+00	hr	4.1E-01
Benzo(a)pyrene Equivalents	Soil, Groundwater	0.13	0	7.0E-01	cm/hr	(1)	hr	2.7E+00	hr	1.2E+01	hr	4.3E+00
Naphthalene	Groundwater	NA	1	4.7E-02	cm/hr	(1)	hr	5.6E-01	hr	1.3E+00	hr	2.0E-01
Inorganics												
Arsenic	Soil, Groundwater	0.03	1	1.0E-03	cm/hr	NA	NA	NA	NA	NA	NA	NA
Chromium VI	Soil, Groundwater	0.025	1	2.0E-03	cm/hr	NA	NA	NA	NA	NA	NA	NA
Copper	Soil	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Soil	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
All values from EPA's Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, July 2004.
1 - T(event) is 4 hours for the construction worker; 1 hr for hypothetical child residents and 0.58 hrs for hypothetical adult residents.
FA = Fraction Absorbed Water
Kp = Dermal Permeability Coefficient of Compound in Water
T(event) = Event Duration
Tau = Lag Time
T* = Time to Reach Steady-State
B = Dimensionless Ratio of the Permeability Coefficient of a Compound Through the Stratum Corneum Relative to its Permeability Coefficient Across the Viable Epidermis
NA = Not applicable.

TABLE E-15
CHEMICAL PROPERTIES FOR VOLATILIZATION FROM GROUNDWATER TO OUTDOOR AIR MODELS
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical	Molecular Weight (g/mole)	Organic Carbon Partition Coefficient (cm^3/g)	Air Diffusivity (cm^2/sec)	Water Diffusivity (cm^2/sec)	Solubility Limit (mg/L)	Henry's Law Constant	
						(Dimensionless)	($atm\text{-}m^3/mol$)
2-Methylnaphthalene	1.42E+02	2.48E+03	5.20E-02	7.80E-06	2.46E+01	2.10E-02	5.18E-04
Naphthalene	1.28E+02	1.54E+03	6.00E-02	8.40E-06	3.10E+01	1.80E-02	4.40E-04

Source:
USEPA 2011: USEPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, June.

TABLE E-16
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[1]	Absorbed RfD for Dermal[2]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons										
2-Methylnaphthalene	Chronic	4.0E-03	mg/kg/day	1	4.0E-03	mg/kg/day	Respiratory	1000/1	IRIS	8/5/2011
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Subchronic	6.0E-01	mg/kg/day	1	6.0E-01	mg/kg/day	Body Weight	NA	ATSDR	9/2005
	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Body Weight	3000/1	IRIS	8/5/2011
Inorganics										
Arsenic	Chronic	3.0E-04	mg/kg/day	1	3.0E-04	mg/kg/day	Skin, CVS	3/1	IRIS	8/5/2011
Chromium[3]	Subchronic	2.0E-02	mg/kg/day	0.025	5.0E-04	mg/kg/day	None Reported	100/3	HEAST	9/1997
	Chronic	3.0E-03	mg/kg/day	0.025	7.5E-05	mg/kg/day	None Reported	300/3	IRIS	8/5/2011
Copper	Subchronic	1.0E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Gastrointestinal	NA	ATSDR	10/2004
	Chronic	4.0E-02	mg/kg/day	1	4.0E-02	mg/kg/day	Gastrointestinal	NA	HEAST	7/1997
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - U.S. EPA, 2004; Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.
3 - Toxicity values are for hexavalent chromium.

Definitions:
ATSDR = Agency for Toxic Substances and Disease Registry
CVS = Cardiovascular system
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NA = Not applicable/not available

TABLE E-17
NON-CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
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Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD[1]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons									
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Chronic	3.0E-03	mg/m^3	8.6E-04	(mg/kg/day)	Respiratory	3000/1	IRIS	8/5/2011
Inorganics									
Arsenic	Chronic	1.5E-05	mg/m^3	4.3E-06	(mg/kg/day)	NA	NA	Cal EPA	9/2009
Chromium[2]	Chronic	1.0E-04	mg/m3	2.9E-05	(mg/kg/day)	Respiratory	300/1	IRIS	8/5/2011
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - Extrapolated RfD = RfC *$20m^3$/day / 70 kg
2 - Toxicity values are for hexavalent chromium.
Definitions:
Cal EPA = California Environmental Protection Agency, Technical Support Document for Describing Available Cancer Slope Factors, September 2009.
IRIS = Integrated Risk Information System
NA = Not applicable/not available

TABLE E-18
CANCER TOXICITY DATA – ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal[1]	Absorbed Cancer Slope Factor for Dermal[2]		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons								
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene[3]	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Benzo(a)pyrene[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	8/5/2011
Benzo(a)pyrene Equivalents[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	8/5/2011
Benzo(b)fluoranthene[3]	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Benzo(k)fluoranthene[3]	7.3E-02	$(mg/kg/day)^{-1}$	1	7.3E-02	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Dibenzo(a,h)anthracene[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Indeno(1,2,3-cd)pyrene[3]	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Naphthalene	NA	NA	NA	NA	NA	C / Possible human carcinogen	NA	NA
Inorganics								
Arsenic	1.5E+00	$(mg/kg/day)^{-1}$	1	1.5E+00	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	8/5/2011
Chromium[3][4]	5.0E-01	$(mg/kg/day)^{-1}$	0.025	2.0E+01	$(mg/kg/day)^{-1}$	D (Not classifiable as to human carcinogenicity)	NJDEP	4/8/2009
Copper	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted cancer slope factor for dermal = Oral cancer slope factor / Oral Absorption Efficiency for Dermal.
3 - The carcinogenic PAHs and hexavalent chromium are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).
4 - Toxicity values are for hexavalent chromium.

ECAO = Environmental Criteria and Assessment Office (EPA, 1993).
IRIS = Integrated Risk Information System.
NA = Not Available.
NJDEP = New Jersey Department of Environmental Protection, Derivation of Ingestion-Based Soil Remediation Criterion for Cr+6 Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate, April 8, 2009.

TABLE E-19
CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
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PAGE 1 OF 1

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor[1]		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons							
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(a)pyrene[2]	1.1E-03	$(ug/m^3)^{-1}$	3.9E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(a)pyrene Equivalents[2]	1.1E-03	$(ug/m^3)^{-1}$	3.9E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(b)fluoranthene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(k)fluoranthene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Dibenzo(a,h)anthracene[2]	1.2E-03	$(ug/m^3)^{-1}$	4.2E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Indeno(1,2,3-cd)pyrene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	1.2E-01	$(mg/kg/day)^{-1}$	C / Possible human carcinogen	IRIS	8/5/2011
Inorganics							
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	1.5E+01	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	8/5/2011
Chromium[3]	8.4E-02	$(ug/m^3)^{-1}$	2.9E+02	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	8/5/2011
Copper	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA

Notes:

1 - Inhalation CSF = Unit Risk * 70 kg / $20m^3$/day.

2 - The carcinogenic PAHs and hexavalent chromium are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

3 - The toxicity values are for hexavalent chromium.

IRIS = Integrated Risk Information System.

NA = Not Available.

Cal EPA(1) = California Environmental Protection Agency, Technical Support Document for Describing Available Cancer Slope Factors, September 2009.

TABLE E-20
SUMMARY OF CANCER RISKS AND HAZARD INDICES - REASONABLE MAXIMUM EXPOSURES
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 3

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an Target Organ HI > 1
Construction Workers	Surface Soil	Incidental Ingestion	2E-06	--	--	--	0.19	--
		Dermal Contact	3E-07	--	--	--	0.01	--
		Inhalation	3E-06	--	--	Chromium VI	0.1	--
		Total	5E-06	--	--	Chromium VI	0.3	--
	Subsurface Soil	Incidental Ingestion	2E-06	--	--	--	0.1	--
		Dermal Contact	3E-07	--	--	--	0.01	--
		Inhalation	3E-06	--	--	Chromium VI	0.1	--
		Total	5E-06	--	--	Chromium VI	0.3	--
	Groundwater	Incidental Ingestion	5E-09	--	--	--	0.001	--
		Dermal Contact	2E-08	--	--	--	0.03	--
		Inhalation	7E-08	--	--	--	0.05	--
		Total	9E-08	--	--	--	0.08	--
		Total SS + GW	5E-06			Total SS + GW	0.4	
		Total SB + GW	5E-06			Total SB + GW	0.4	
Industrial Workers	Surface Soil	Incidental Ingestion	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.04	--
		Dermal Contact	5E-06	--	--	Benzo(a)pyrene Equivalents	0.006	--
		Inhalation	1E-07	--	--	--	0.0002	--
		Total	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.05	--
	Subsurface Soil	Incidental Ingestion	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.04	--
		Dermal Contact	5E-06	--	--	Benzo(a)pyrene Equivalents	0.007	--
		Inhalation	1E-07	--	--	--	0.0002	--
		Total	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.05	--
Child Recreational Users	Surface Soil	Incidental Ingestion	7E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	0.3	--
		Dermal Contact	1E-05	--	--	Benzo(a)pyrene Equivalents	0.02	--
		Inhalation	5E-08	--	--	--	0.00006	--
		Total	8E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	0.3	--
	Subsurface Soil	Incidental Ingestion	6E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	0.2	--
		Dermal Contact	1E-05	--	--	Benzo(a)pyrene Equivalents	0.02	--
		Inhalation	5E-08	--	--	--	0.00007	--
		Total	7E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	0.3	--
Adult Recreational Users	Surface Soil	Incidental Ingestion	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.03	--
		Dermal Contact	3E-06	--	--	Benzo(a)pyrene Equivalents	0.002	--
		Inhalation	4E-08	--	--	--	0.00004	--
		Total	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.03	--
	Subsurface Soil	Incidental Ingestion	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.03	--
		Dermal Contact	3E-06	--	--	Benzo(a)pyrene Equivalents	0.003	--
		Inhalation	4E-08	--	--	--	0.00004	--
		Total	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.03	--

TABLE E-20
SUMMARY OF CANCER RISKS AND HAZARD INDICES - REASONABLE MAXIMUM EXPOSURES
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an Target Organ HI > 1
Lifelong Recreational Users	Surface Soil	Incidental Ingestion	8E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	NA	--
		Dermal Contact	2E-05	--	Benzo(a)pyrene Equivalents	--	NA	--
		Inhalation	9E-08	--	--	--	NA	--
		Total	1E-04	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	NA	--
	Subsurface Soil	Incidental Ingestion	7E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	NA	--
		Dermal Contact	1E-05	--	--	Benzo(a)pyrene Equivalents	NA	--
		Inhalation	9E-08	--	--	--	NA	--
		Total	9E-05	--	Benzo(a)pyrene Equivalents, Chromium VI	Arsenic	NA	--
Child Residents	Surface Soil	Incidental Ingestion	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	0.6	--
		Dermal Contact	3E-05	--	Benzo(a)pyrene Equivalents	--	0.04	--
		Inhalation	6E-07	--	--	--	0.0008	--
		Total	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	0.6	--
	Subsurface Soil	Incidental Ingestion	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	0.5	--
		Dermal Contact	3E-05	--	Benzo(a)pyrene Equivalents	--	0.04	--
		Inhalation	6E-07	--	--	--	0.0009	--
		Total	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	0.5	--
	Groundwater	Incidental Ingestion	6E-05	--	Arsenic	Benzo(a)pyrene Equivalents, Chromium VI	2	Target Organ HIs ≤ 1
		Dermal Contact	3E-06	--	--	Chromium VI	0.8	--
		Inhalation	1E-05	--	--	Naphthalene	2	Naphthalene
		Total	7E-05	--	Arsenic	Benzo(a)pyrene Equivalents, Chromium VI	5	Naphthalene, 2-Methylnaphthalene
		Total SS + GW	2E-04			Total SS + GW	6	
		Total SB + GW	2E-04			Total SB + GW	6	
Adult Residents	Surface Soil	Incidental Ingestion	3E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.06	--
		Dermal Contact	7E-06	--	--	Benzo(a)pyrene Equivalents	0.005	--
		Inhalation	9E-07	--	--	--	0.0008	--
		Total	3E-05	--	Benzo(a)pyrene Equivalents	Arsenic, Chromium VI	0.07	--
	Subsurface Soil	Incidental Ingestion	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	0.05	--
		Dermal Contact	6E-06	--	--	Benzo(a)pyrene Equivalents	0.006	--
		Inhalation	9E-07	--	--	--	0.0009	--
		Total	3E-05	--	Benzo(a)pyrene Equivalents	Arsenic, Chromium VI	0.06	--
	Groundwater	Incidental Ingestion	9E-05	--	Arsenic	Benzo(a)pyrene Equivalents, Chromium VI	0.9	--
		Dermal Contact	2E-06	--	--	--	0.3	--
		Inhalation	6E-05	--	Naphthalene	--	2	Naphthalene
		Total	2E-04	--	Arsenic, Naphthalene	Benzo(a)pyrene Equivalents, Chromium VI	3	Naphthalene
		Total SS + GW	2E-04			Total SS + GW	3	
		Total SB + GW	2E-04			Total SB + GW	3	

TABLE E-20
SUMMARY OF CANCER RISKS AND HAZARD INDICES - REASONABLE MAXIMUM EXPOSURES
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an Target Organ HI > 1
Lifelong Residents	Surface Soil	Incidental Ingestion	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	NA	--
		Dermal Contact	4E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
		Inhalation	1E-06	--	--	--	NA	--
		Total	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	NA	--
	Subsurface Soil	Incidental Ingestion	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	NA	--
		Dermal Contact	3E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
		Inhalation	1E-06	--	--	--	NA	--
		Total	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic, Chromium VI	--	NA	--
	Groundwater	Incidental Ingestion	2E-04	--	Arsenic	Benzo(a)pyrene Equivalents, Chromium VI	NA	--
		Dermal Contact	5E-06	--	--	Chromium VI	NA	--
		Inhalation	7E-05	--	Naphthalene	--	NA	--
		Total	2E-04	--	Arsenic, Naphthalene	Benzo(a)pyrene Equivalents, Chromium VI	NA	--
		Total SS + GW	4E-04					
		Total SB + GW	4E-04					

Chemicals with individual cancer risks greater than 1x10-6 or individual HIs greater than 0.1 that contribute to a target organ-specific HI exceeding 1 are presented.

GW = Groundwater
SS = Surface soil
SB = Subsurface soil

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Indoor Air

Exposure Point	CAS Number	Chemical	MDEQ Background Concentration[4]	MDEQ Residential Generic Cleanup Criterion[5]	COPC Flag	Rationale for Contaminant Deletion or Selection[6]
	METALS					
	7440-38-2	Arsenic	5.8	NA	No	NTX
	7440-39-3	Barium	75	NA	No	NTX
	7440-43-9	Cadmium	1	NA	No	NTX
	7440-47-3	Chromium	18	NA	No	NTX
	7440-50-8	Copper	32	NA	No	NTX
	7439-92-1	Lead	2	NA	No	NTX
	7439-97-6	Mercury	0.13	48	No	BSL
	7782-49-2	Selenium	0.41	NA	No	NTX
	7440-22-4	Silver	1	NA	No	NTX
	7440-66-6	Zinc	47	NA	No	NTX
	POLYCYCLIC AROMATIC HYDRO					
	91-57-6	2-Methylnaphthalene	NA	NA	No	NTX
	83-32-9	Acenaphthene	NA	1.90E+08	No	BSL
	208-96-8	Acenaphthylene	NA	1.60E+06	No	BSL
	120-12-7	Anthracene	NA	1.00E+09	No	BSL
	56-55-3	Benzo(a)anthracene	NA	NA	No	NTX
	50-32-8	Benzo(a)pyrene	NA	NA	No	NTX
	--	Benzo(a)pyrene Equiva	NA	NA	No	NTX
	205-99-2	Benzo(b)fluoranthene	NA	NA	No	NTX
	191-24-2	Benzo(g,h,i)perylene	NA	NA	No	NTX
	207-08-9	Benzo(k)fluoranthene	NA	NA	No	NTX
	218-01-9	Chrysene	NA	NA	No	NTX
	53-70-3	Dibenzo(a,h)anthracen	NA	NA	No	NTX
	206-44-0	Fluoranthene	NA	1.90E+09	No	BSL
	86-73-7	Fluorene	NA	5.80E+08	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	NA	NA	No	NTX
	91-20-3	Naphthalene	NA	2.50E+05	No	BSL
	85-01-8	Phenanthrene	NA	2.80E+06	No	BSL
	129-00-0	Pyrene	NA	1.00E+09	No	BSL

Footnotes:

1 - Sample and duplicate are considered as two separ
2 - Values presented are sample-specific quantitation
3 - The maximum detected concentration is used for
4 - No site background data are available. Backgroun
5 - Michigan Department of Environmental Quality (MI risk of 1x10-5 or a hazard quotient of 1.
6 - The chemical is selected as a COPC if the maximu
Shaded criterion indicates that the maximum detected chemical was retained as a COPC.

Definitions:

COPC = Chemical of potential concern
J = Estimated value
NA = Not applicable/not available

Rationale Codes:

For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below screening level

Associated Samples:

DASS101-0002
DASS102-0002
DASS102A-0002
DASS102A-0002-D
DASS103-0002
DASS104-0002
DASS104A-0002
DASS105-0002
DASS106-0002
DASS106A-0002
DASS107-0002
DASS108-0002
DASS109-0002
DASS109-0002-D
DASS109A-0002
DASS110-0002
DASS110A-0002
DASS111-0002

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Indoor Air

Exposure Point	CAS Number	Chemical	MDEQ ckground centration[4]	MDEQ Residential Generic Cleanup Criterion[5]	COPC Flag	Rationale for Contaminant Deletion or Selection[6]
	METALS					
	7440-38-2	Arsenic	5.8	NA	No	NTX
	7440-39-3	Barium	75	NA	No	NTX
	7440-43-9	Cadmium	1	NA	No	NTX
	7440-47-3	Chromium	18	NA	No	NTX
	7440-50-8	Copper	32	NA	No	NTX
	7439-92-1	Lead	2	NA	No	NTX
	7439-97-6	Mercury	0.13	48	No	BSL
	7782-49-2	Selenium	0.41	NA	No	NTX
	7440-22-4	Silver	1	NA	No	NTX
	7440-66-6	Zinc	47	NA	No	NTX
	POLYCYCLIC AROMATIC HYDROC					
	91-57-6	2-Methylnaphthalene	NA	NA	No	NTX
	83-32-9	Acenaphthene	NA	1.90E+08	No	BSL
	208-96-8	Acenaphthylene	NA	1.60E+06	No	BSL
	120-12-7	Anthracene	NA	1.00E+09	No	BSL
	--	Benzo(a)pyrene Equiva	NA	NA	No	NTX
	56-55-3	Benzo(a)anthracene	NA	NA	No	NTX
	50-32-8	Benzo(a)pyrene	NA	NA	No	NTX
	205-99-2	Benzo(b)fluoranthene	NA	NA	No	NTX
	191-24-2	Benzo(g,h,i)perylene	NA	NA	No	NTX
	207-08-9	Benzo(k)fluoranthene	NA	NA	No	NTX
	218-01-9	Chrysene	NA	NA	No	NTX
	53-70-3	Dibenzo(a,h)anthracen	NA	NA	No	NTX
	206-44-0	Fluoranthene	NA	1.90E+09	No	BSL
	86-73-7	Fluorene	NA	5.80E+08	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	NA	NA	No	NTX
	91-20-3	Naphthalene	NA	2.50E+05	No	BSL
	85-01-8	Phenanthrene	NA	2.80E+06	No	BSL
	129-00-0	Pyrene	NA	1.00E+09	No	BSL

Footnotes:

1 - Sample and duplicate are considered as two separ
2 - Values presented are sample-specific quantitation
3 - The maximum detected concentration is used for s
4 - No site background data are available. Backgroun
5 - Adjusted USEPA Regional Screening Level (RSL)
6 - Michigan Department of Environmental Quality (MD
of 1x10-5 or a hazard quotient of 1.
7 - The chemical is selected as a COPC if the maximu

Shaded criterion indicates that the maximum detected chemical was retained as a COPC.

Associated Samples:

DASB101-0305	DASB106-0305
DASB102-0305	DASB106A-0204
DASB102A-0406	DASB107-0204
DASB102A-0406-D	DASB108-0305
DASB103-0305	DASB109-0305
DASB104-0305	DASB109A-0204
DASB104A-0204	DASB110-0305
DASB105-0305	DASB110A-0305

Definitions:

COPC = Chemical of potential concern
J = Estimated value

NA = Not applicable/not available

Rationale Codes:

For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below screening level

TABLE E-23
UNCERTAINTY ASSOCIATED WITH CHROMIUM TOXICITY - SUMMARY OF CANCER RISKS AND HAZARD INDICES EXCLUDING CHROMIUM
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an Target Organ HI > 1
Construction Workers	Surface Soil	Incidental Ingestion	1E-06	--	--	--	0.2	--
		Dermal Contact	3E-07	--	--	--	0.010	--
		Inhalation	1E-07	--	--	--	0.1	--
		Total	2E-06	--	--	--	0.3	--
	Subsurface Soil	Incidental Ingestion	1E-06	--	--	--	0.1	--
		Dermal Contact	3E-07	--	--	--	0.01	--
		Inhalation	1E-07	--	--	--	0.1	--
		Total	2E-06	--	--	--	0.2	--
	Groundwater	Incidental Ingestion	5E-09	--	--	--	0.0009	--
		Dermal Contact	6E-09	--	--	--	0.03	--
		Inhalation	7E-08	--	--	--	0.05	--
		Total	8E-08	--	--	--	0.08	--
		Total SS + GW	2E-06			Total SS + GW	0.4	
		Total SB + GW	2E-06			Total SB + GW	0.3	
Industrial Workers	Surface Soil	Incidental Ingestion	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.04	--
		Dermal Contact	5E-06	--	--	Benzo(a)pyrene Equivalents	0.006	--
		Inhalation	4E-09	--	--	--	0.0002	--
		Total	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.04	--
	Subsurface Soil	Incidental Ingestion	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.03	--
		Dermal Contact	5E-06	--	--	Benzo(a)pyrene Equivalents	0.007	--
		Inhalation	4E-09	--	--	--	0.0002	--
		Total	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.04	--
Child Recreational Users	Surface Soil	Incidental Ingestion	5E-05	--	Benzo(a)pyrene Equivalents	Arsenic	0.2	--
		Dermal Contact	1E-05	--	--	Benzo(a)pyrene Equivalents	0.02	--
		Inhalation	4E-10	--	--	--	0.00005	--
		Total	6E-05	--	Benzo(a)pyrene Equivalents	Arsenic	0.2	--
	Subsurface Soil	Incidental Ingestion	4E-05	--	Benzo(a)pyrene Equivalents	Arsenic	0.2	--
		Dermal Contact	1E-05	--	--	Benzo(a)pyrene Equivalents	0.02	--
		Inhalation	4E-10	--	--	--	0.00005	--
		Total	5E-05	--	Benzo(a)pyrene Equivalents	Arsenic	0.2	--
Adult Recreational Users	Surface Soil	Incidental Ingestion	9E-06	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.02	--
		Dermal Contact	3E-06	--	--	Benzo(a)pyrene Equivalents	0.002	--
		Inhalation	8E-10	--	--	--	0.00003	--
		Total	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.03	--
	Subsurface Soil	Incidental Ingestion	8E-06	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.02	--
		Dermal Contact	3E-06	--	--	Benzo(a)pyrene Equivalents	0.003	--
		Inhalation	8E-10	--	--	--	0.00003	--
		Total	1E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.02	--

TABLE E-23
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DETROIT, MICHIGAN

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Lifelong Recreational Users	Surface Soil	Incidental Ingestion	6E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
		Dermal Contact	2E-05	--	Benzo(a)pyrene Equivalents	--	NA	--
		Inhalation	1E-09	--	--	--	NA	--
		Total	7E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
	Subsurface Soil	Incidental Ingestion	5E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
		Dermal Contact	1E-05	--	--	Benzo(a)pyrene Equivalents	NA	--
		Inhalation	1E-09	--	--	--	NA	--
		Total	6E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
Child Residents	Surface Soil	Incidental Ingestion	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	0.5	--
		Dermal Contact	3E-05	--	Benzo(a)pyrene Equivalents	--	0.04	--
		Inhalation	5E-09	--	--	--	0.0007	--
		Total	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	0.5	--
	Subsurface Soil	Incidental Ingestion	9E-05	--	Benzo(a)pyrene Equivalents, Arsenic	--	0.4	--
		Dermal Contact	3E-05	--	Benzo(a)pyrene Equivalents	--	0.04	--
		Inhalation	5E-09	--	--	--	0.0007	--
		Total	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	0.5	--
	Groundwater	Incidental Ingestion	6E-05	--	Arsenic	Benzo(a)pyrene Equivalents	2	Target Organ HIs ≤ 1
		Dermal Contact	3E-07	--	--	--	0.8	--
		Inhalation	1E-05	--	--	Naphthalene	2	Naphthalene
		Total	7E-05	--	Arsenic	Benzo(a)pyrene Equivalents, Naphthalene	5	Naphthalene, 2-Methylnaphthalene
		Total SS + GW	2E-04			Total SS + GW	5	
		Total SB + GW	2E-04			Total SB + GW	5	
Adult Residents	Surface Soil	Incidental Ingestion	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.05	--
		Dermal Contact	7E-06	--	--	Benzo(a)pyrene Equivalents	0.005	--
		Inhalation	2E-08	--	--	--	0.0007	--
		Total	3E-05	--	Benzo(a)pyrene Equivalents	Arsenic	0.06	--
	Subsurface Soil	Incidental Ingestion	2E-05	--	--	Benzo(a)pyrene Equivalents, Arsenic	0.05	--
		Dermal Contact	6E-06	--	--	Benzo(a)pyrene Equivalents	0.006	--
		Inhalation	2E-08	--	--	--	0.0007	--
		Total	2E-05	--	Benzo(a)pyrene Equivalents	Arsenic	0.05	--
	Groundwater	Incidental Ingestion	9E-05	--	Arsenic	Benzo(a)pyrene Equivalents	0.9	--
		Dermal Contact	5E-07	--	--	--	0.3	--
		Inhalation	6E-05	--	Naphthalene	--	2	Naphthalene
		Total	2E-04	--	Naphthalene, Arsenic	Benzo(a)pyrene Equivalents	3	2-Methylnaphthalene
		Total SS + GW	2E-04			Total SS + GW	3	
		Total SB + GW	2E-04			Total SB + GW	3	

TABLE E-23
UNCERTAINTY ASSOCIATED WITH CHROMIUM TOXICITY - SUMMARY OF CANCER RISKS AND HAZARD INDICES EXCLUDING CHROMIUM
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks $> 10^{-4}$	Chemicals with Cancer Risks $> 10^{-5}$ and $\leq 10^{-4}$	Chemicals with Cancer Risks $> 10^{-6}$ and $\leq 10^{-5}$	Hazard Index	Chemicals Contributing to an Target Organ HI > 1
Lifelong Residents	Surface Soil	Incidental Ingestion	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	NA	--
		Dermal Contact	4E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
		Inhalation	2E-08	--	--	--	NA	--
		Total	2E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	NA	--
	Subsurface Soil	Incidental Ingestion	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	NA	--
		Dermal Contact	3E-05	--	Benzo(a)pyrene Equivalents	Arsenic	NA	--
		Inhalation	2E-08	--	--	--	NA	--
		Total	1E-04	--	Benzo(a)pyrene Equivalents, Arsenic	--	NA	--
	Groundwater	Incidental Ingestion	1E-04	--	Arsenic	Benzo(a)pyrene Equivalents	NA	--
		Dermal Contact	8E-07	--	--	--	NA	--
		Inhalation	7E-05	--	Naphthalene	--	NA	--
		Total	2E-04	--	Arsenic, Naphthalene	Benzo(a)pyrene Equivalents	NA	--
		Total SS + GW	4E-04					
		Total SB + GW	3E-04					

Chemicals with Individual cancer risks greater than 1x10-6 or individual HIs greater than 0.1 that contribute to a target organ-specific HI exceeding 1 are presented.

GW = Groundwater
SS = Surface soil
SB = Subsurface soil

ATTACHMENTS - SUPPORTING INFORMATION FOR HEALTH RISK ASSESSMENT

Attachment 1 - Analytical Results Summaries

Attachment 2 - Detected Concentration Summaries

Attachment 3 - RAGS Part D Tables

Attachment 4 - ProUCL Output Files

Attachment 5 - Sample Calculations

Attachment 6 - Vapor Intrusion

ATTACHMENT 1

ANALYTICAL RESULTS SUMMARIES

USCG Atwater [redacted]rface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS101	DASS102	DASS102A	DASS102A
SAMPLE ID	DASS101-0002	DASS102-0002	DASS102A-0002	DASS102A-0002-AVG
SAMPLE DATE	4/21/2010	4/20/2010	5/25/2011	5/25/2011
SACODE	NORMAL	NORMAL	ORIG	AVG
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	5.7	5.7	--	--
BARIUM	59	56	--	--
CADMIUM	0.28	0.27	--	--
CHROMIUM	15	14 J	--	--
COPPER	16	16	--	--
LEAD	31	34	--	--
MERCURY	0.062	--	0.053	0.0675
SELENIUM	0.28	0.18	--	--
SILVER	0.079	0.072	--	--
ZINC	62	62	--	--
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	87	87
TOTAL SOLIDS (%)	88	87	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.0045 J	--	0.27	0.141
ACENAPHTHENE	0.013 J	--	0.12 J	0.083
ACENAPHTHYLENE	0.0071 J	--	0.19 U	0.19 U
ANTHRACENE	0.059	--	0.25 J	0.175
BAP EQUIVALENT	0.22466	--	0.62838	0.541635
BENZO(A)ANTHRACENE	0.18	--	0.54 J	0.43
BENZO(A)PYRENE	0.15	--	0.4 J	0.34
BENZO(B)FLUORANTHENE	0.2	--	0.58 J	0.445
BENZO(G,H,I)PERYLENE	0.11	--	0.22	0.185
BENZO(K)FLUORANTHENE	0.069	--	0.18 J	0.17
CHRYSENE	0.17	--	0.58 J	0.435
DIBENZO(A,H)ANTHRACENE	0.026	--	0.19 U	0.19 U
FLUORANTHENE	0.37	--	1	0.8
FLUORENE	0.018 J	--	0.22	0.133
INDENO(1,2,3-CD)PYRENE	0.098	--	0.19	0.17
NAPHTHALENE	0.0058 J	--	0.2	0.1135
PHENANTHRENE	0.21	--	1.2 J	0.815
PYRENE	0.3	--	0.97 J	0.765

USCG Atwater - Surface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS102A	DASS103	DASS104	DASS104A
SAMPLE ID	DASS102A-0002-D	DASS103-0002	DASS104-0002	DASS104A-0002
SAMPLE DATE	5/25/2011	4/21/2010	4/20/2010	5/25/2011
SACODE	DUP	NORMAL	NORMAL	NORMAL
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	--	6.8	11	--
BARIUM	--	49	110	--
CADMIUM	--	0.18	0.79	--
CHROMIUM	--	13	18 J	--
COPPER	--	14	79	--
LEAD	--	43	360	--
MERCURY	0.082	0.044 J	--	0.19
SELENIUM	--	0.25	0.5	--
SILVER	--	0.085	0.15	--
ZINC	--	45	270	--
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	87	--	--	88
TOTAL SOLIDS (%)	--	92	85	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.012 J	0.0031 J	--	0.19 U
ACENAPHTHENE	0.046 J	0.008 J	--	0.049 J
ACENAPHTHYLENE	0.19 U	0.0088 J	--	0.049 J
ANTHRACENE	0.1 J	0.029	--	0.22
BAP EQUIVALENT	0.45489	0.21718	--	1.628
BENZO(A)ANTHRACENE	0.32 J	0.16	--	1.4
BENZO(A)PYRENE	0.28	0.14	--	1.2
BENZO(B)FLUORANTHENE	0.31 J	0.21	--	1.3
BENZO(G,H,I)PERYLENE	0.15 J	0.092	--	0.51
BENZO(K)FLUORANTHENE	0.16 J	0.071	--	0.69
CHRYSENE	0.29 J	0.17	--	1.1
DIBENZO(A,H)ANTHRACENE	0.19 U	0.031	--	0.19 U
FLUORANTHENE	0.6	0.32	--	1.9
FLUORENE	0.046 J	0.011 J	--	0.046 J
INDENO(1,2,3-CD)PYRENE	0.15 J	0.083	--	0.55
NAPHTHALENE	0.027 J	0.0024 J	--	0.023 J
PHENANTHRENE	0.43 J	0.18	--	0.68
PYRENE	0.56 J	0.28	--	2.1

USCG Atwater [redacted]rface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS105	DASS106	DASS106A	DASS107
SAMPLE ID	DASS105-0002	DASS106-0002	DASS106A-0002	DASS107-0002
SAMPLE DATE	4/21/2010	4/20/2010	5/25/2011	4/21/2010
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	6.6	6.4	--	8.7
BARIUM	74	75	--	65
CADMIUM	0.3	0.33	--	0.57
CHROMIUM	17	14 J	--	16
COPPER	29	49	--	130
LEAD	85	99	--	190
MERCURY	0.24	--	0.043 J	0.11
SELENIUM	0.18	0.78	--	0.32
SILVER	0.1	0.11	--	0.078
ZINC	87	88	--	130
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	84	--
TOTAL SOLIDS (%)	88	87	--	89
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	4.3	--	0.2 U	0.015 J
ACENAPHTHENE	0.98	--	0.2 U	0.02 J
ACENAPHTHYLENE	0.73 J	--	0.2 U	0.022 J
ANTHRACENE	2.1	--	0.14 J	0.082 J
BAP EQUIVALENT	4.2118	--	0.48275	0.33484
BENZO(A)ANTHRACENE	3.7	--	0.4	0.3
BENZO(A)PYRENE	2.9	--	0.29	0.23
BENZO(B)FLUORANTHENE	3.2	--	0.39	0.36 J
BENZO(G,H,I)PERYLENE	1.5	--	0.12 J	0.14
BENZO(K)FLUORANTHENE	2.3	--	0.14 J	0.057 J
CHRYSENE	3.8	--	0.35	0.27
DIBENZO(A,H)ANTHRACENE	0.95 U	--	0.2 U	0.021 J
FLUORANTHENE	8.4	--	0.74	0.5
FLUORENE	2.2	--	0.2 U	0.026 J
INDENO(1,2,3-CD)PYRENE	1.2	--	0.12 J	0.17
NAPHTHALENE	3	--	0.2 U	0.01 J
PHENANTHRENE	13	--	0.48	0.31
PYRENE	8.2	--	0.76	0.53

USCG Atwater - Surface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS108	DASS109	DASS109	DASS109
SAMPLE ID	DASS108-0002	DASS109-0002	DASS109-0002-AVG	DASS109-0002-D
SAMPLE DATE	4/21/2010	4/20/2010	4/20/2010	4/20/2010
SACODE	NORMAL	ORIG	AVG	DUP
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	2.5	9.2	9.05	8.9
BARIUM	26	150	140	130
CADMIUM	0.16	0.45	0.45	0.45
CHROMIUM	10	12 J	13	14 J
COPPER	8.7	71	69	67
LEAD	11	450	400	350
MERCURY	0.018 J	--	--	--
SELENIUM	0.1 U	0.59	0.58	0.57
SILVER	0.045 J	0.13	0.12	0.11
ZINC	31	200	195	190
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	--	--
TOTAL SOLIDS (%)	93	92	91	90
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.036 U	--	--	--
ACENAPHTHENE	0.036 U	--	--	--
ACENAPHTHYLENE	0.0033 J	--	--	--
ANTHRACENE	0.013 J	--	--	--
BAP EQUIVALENT	0.101303	--	--	--
BENZO(A)ANTHRACENE	0.057	--	--	--
BENZO(A)PYRENE	0.067	--	--	--
BENZO(B)FLUORANTHENE	0.065	--	--	--
BENZO(G,H,I)PERYLENE	0.044	--	--	--
BENZO(K)FLUORANTHENE	0.045	--	--	--
CHRYSENE	0.053	--	--	--
DIBENZO(A,H)ANTHRACENE	0.036 U	--	--	--
FLUORANTHENE	0.081	--	--	--
FLUORENE	0.0038 J	--	--	--
INDENO(1,2,3-CD)PYRENE	0.036	--	--	--
NAPHTHALENE	0.036 U	--	--	--
PHENANTHRENE	0.051	--	--	--
PYRENE	0.076	--	--	--

USCG Atwater rface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS109A	DASS110	DASS110A	DASS111
SAMPLE ID	DASS109A-0002	DASS110-0002	DASS110A-0002	DASS111-0002
SAMPLE DATE	5/25/2011	4/20/2010	5/25/2011	4/20/2010
SACODE	NORMAL	NORMAL	NORMAL	ORIG
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	--	8.1	--	7.6
BARIUM	--	140	--	110
CADMIUM	--	1.3	--	0.86
CHROMIUM	--	11 J	--	13 J
COPPER	--	220	--	190
LEAD	--	480	--	370
MERCURY	0.031 J	--	0.37	--
SELENIUM	--	0.57	--	0.5
SILVER	--	0.23	--	0.2
ZINC	--	660	--	450 J
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	95	--	88	--
TOTAL SOLIDS (%)	--	91	--	91
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	1.8 U	--	0.019 J	--
ACENAPHTHENE	1.8 U	--	0.19 U	--
ACENAPHTHYLENE	1.8 U	--	0.19 U	--
ANTHRACENE	1.8 U	--	0.075 J	--
BAP EQUIVALENT	1.55558	--	0.66465	--
BENZO(A)ANTHRACENE	0.58 J	--	0.47	--
BENZO(A)PYRENE	0.45 J	--	0.44	--
BENZO(B)FLUORANTHENE	0.55 J	--	0.6	--
BENZO(G,H,I)PERYLENE	0.24 J	--	0.22	--
BENZO(K)FLUORANTHENE	0.21 J	--	0.22	--
CHRYSENE	0.48 J	--	0.45	--
DIBENZO(A,H)ANTHRACENE	1.8 U	--	0.19 U	--
FLUORANTHENE	0.58 J	--	0.8	--
FLUORENE	1.8 U	--	0.19 U	--
INDENO(1,2,3-CD)PYRENE	1.8 U	--	0.2	--
NAPHTHALENE	1.8 U	--	0.023 J	--
PHENANTHRENE	0.55 J	--	0.33	--
PYRENE	1.8	--	0.8	--

USCG Atwater - Surface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS111	DASS111	DASS111A	DASS112
SAMPLE ID	DASS111-0002-AVG	DASS111-0002-D	DASS111A-0002	DASS112-0002
SAMPLE DATE	4/20/2010	4/20/2010	5/25/2011	4/20/2010
SACODE	AVG	DUP	NORMAL	NORMAL
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	7.9	8.2	--	19
BARIUM	125	140	--	420
CADMIUM	0.825	0.79	--	2.6
CHROMIUM	12.5	12 J	--	15 J
COPPER	205	220	--	620
LEAD	340	310	--	970
MERCURY	--	--	0.64	--
SELENIUM	0.525	0.55	--	0.6
SILVER	0.185	0.17	--	0.28
ZINC	360	270 J	--	670
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	88	--
TOTAL SOLIDS (%)	91	91	--	89
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	--	--	0.056 J	--
ACENAPHTHENE	--	--	0.24	--
ACENAPHTHYLENE	--	--	0.089 J	--
ANTHRACENE	--	--	0.69	--
BAP EQUIVALENT	--	--	3.3053	--
BENZO(A)ANTHRACENE	--	--	2.6	--
BENZO(A)PYRENE	--	--	2.3	--
BENZO(B)FLUORANTHENE	--	--	2.9	--
BENZO(G,H,I)PERYLENE	--	--	1.1	--
BENZO(K)FLUORANTHENE	--	--	1.3	--
CHRYSENE	--	--	2.3	--
DIBENZO(A,H)ANTHRACENE	--	--	0.32	--
FLUORANTHENE	--	--	4.6	--
FLUORENE	--	--	0.23	--
INDENO(1,2,3-CD)PYRENE	--	--	1.2	--
NAPHTHALENE	--	--	0.063 J	--
PHENANTHRENE	--	--	3.4	--
PYRENE	--	--	5.1	--

USCG Atwater[illegible]rface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS112A	DASS114	DASS115	DASS115
SAMPLE ID	DASS112A-0002	DASS114-0002	DASS115-0002	DASS115-0002-AVG
SAMPLE DATE	5/25/2011	4/21/2010	4/20/2010	4/20/2010
SACODE	NORMAL	NORMAL	ORIG	AVG
DEPTH	0 - 2'	0 - 2'	0 - 2'	0 - 2'
METALS (MG/KG)				
ARSENIC	--	7.3	8.4	8.6
BARIUM	--	140	100	105
CADMIUM	--	0.71	0.42	0.47
CHROMIUM	--	20 J	14 J	15
COPPER	--	77	85	97.5
LEAD	--	410	280	290
MERCURY	0.54	0.41 J	--	--
SELENIUM	--	0.5	0.74	0.74
SILVER	--	0.12	0.095	0.0975
ZINC	--	210	140	160
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	90	--	--	--
TOTAL SOLIDS (%)	--	93	92	91.5
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.017 J	0.36 U	--	--
ACENAPHTHENE	0.01 J	0.36 U	--	--
ACENAPHTHYLENE	0.037 U	0.36 U	--	--
ANTHRACENE	0.029 J	0.092 J	--	--
BAP EQUIVALENT	0.16569	0.92522	--	--
BENZO(A)ANTHRACENE	0.14	0.6	--	--
BENZO(A)PYRENE	0.11	0.56	--	--
BENZO(B)FLUORANTHENE	0.16	0.8	--	--
BENZO(G,H,I)PERYLENE	0.07	0.51	--	--
BENZO(K)FLUORANTHENE	0.067	0.73	--	--
CHRYSENE	0.12	0.92	--	--
DIBENZO(A,H)ANTHRACENE	0.037 U	0.36 U	--	--
FLUORANTHENE	0.16	0.86	--	--
FLUORENE	0.014 J	0.36 U	--	--
INDENO(1,2,3-CD)PYRENE	0.064	0.37	--	--
NAPHTHALENE	0.015 J	0.034 J	--	--
PHENANTHRENE	0.13	0.36	--	--
PYRENE	0.25	0.8	--	--

USCG Atwater - Surface Soil (0 - 2')

Full Appendix Results

LOCATION	DASS115	DASS115A
SAMPLE ID	DASS115-0002-D	DASS115A-0002
SAMPLE DATE	4/20/2010	5/25/2011
SACODE	DUP	NORMAL
DEPTH	0 - 2'	0 - 2'
METALS (MG/KG)		
ARSENIC	8.8	--
BARIUM	110	--
CADMIUM	0.52	--
CHROMIUM	16 J	--
COPPER	110	--
LEAD	300	--
MERCURY	--	0.54
SELENIUM	0.74	--
SILVER	0.1	--
ZINC	180	--
MISCELLANEOUS PARAMETERS		
PERCENT SOLIDS (%)	--	89
TOTAL SOLIDS (%)	91	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)		
2-METHYLNAPHTHALENE	--	1.9 U
ACENAPHTHENE	--	1.9 U
ACENAPHTHYLENE	--	1.9 U
ANTHRACENE	--	1.9 U
BAP EQUIVALENT	--	1.60966
BENZO(A)ANTHRACENE	--	0.5 J
BENZO(A)PYRENE	--	0.46 J
BENZO(B)FLUORANTHENE	--	0.5 J
BENZO(G,H,I)PERYLENE	--	0.53 J
BENZO(K)FLUORANTHENE	--	0.42 J
CHRYSENE	--	0.46 J
DIBENZO(A,H)ANTHRACENE	--	1.9 U
FLUORANTHENE	--	0.61 J
FLUORENE	--	1.9 U
INDENO(1,2,3-CD)PYRENE	--	1.9 U
NAPHTHALENE	--	1.9 U
PHENANTHRENE	--	0.69 J
PYRENE	--	1.8 J

USCG Atwater - Surface Soil (0 - 2') Full Appendix Results

Footnotes:

-- = The chemical was not analyzed or the data were not used in the risk assessment.

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

USCG Atwater - Subsurface Soil (> 2')

Full Appendix Results

LOCATION	DASB101	DASB102	DASB102A	DASB102A
SAMPLE ID	DASB101-0305	DASB102-0305	DASB102A-0406	DASB102A-0406-AVG
SAMPLE DATE	4/21/2010	4/20/2010	5/25/2011	5/25/2011
SACODE	NORMAL	NORMAL	ORIG	AVG
DEPTH	(3 - 5')	(3 - 5')	(4 - 6')	(4 - 6')
METALS (MG/KG)				
ARSENIC	7.6	16	--	--
BARIUM	90	82	--	--
CADMIUM	0.23	0.21	--	--
CHROMIUM	18	14 J	--	--
COPPER	23	37	--	--
LEAD	180	140	--	--
MERCURY	0.3 J	--	0.32	0.305
SELENIUM	0.37	0.33	--	--
SILVER	0.13	0.098	--	--
ZINC	93	90	--	--
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	88	86.5
TOTAL SOLIDS (%)	87	86	--	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.007 J	--	1.8	1.9
ACENAPHTHENE	0.023	--	0.38	0.445
ACENAPHTHYLENE	0.017 J	--	0.13 J	0.155
ANTHRACENE	0.11	--	0.45 J	0.725
BAP EQUIVALENT	0.46073	--	0.97189	1.553645
BENZO(A)ANTHRACENE	0.49	--	0.99 J	1.545
BENZO(A)PYRENE	0.31	--	0.66 J	1.03
BENZO(B)FLUORANTHENE	0.28	--	0.86 J	1.48
BENZO(G,H,I)PERYLENE	0.15	--	0.3 J	0.465
BENZO(K)FLUORANTHENE	0.23	--	0.4 J	0.67
CHRYSENE	0.43	--	0.89 J	1.445
DIBENZO(A,H)ANTHRACENE	0.056	--	0.19 U	0.1675
FLUORANTHENE	0.86	--	1.7 J	2.8
FLUORENE	0.024	--	0.92	1.11
INDENO(1,2,3-CD)PYRENE	0.15	--	0.27 J	0.455
NAPHTHALENE	0.0085 J	--	1.7	1.6
PHENANTHRENE	0.37	--	3.2 J	4.65
PYRENE	0.72	--	2 J	2.95

USCG Atwater Subsurface Soil (> 2')

Full Appendix Results

LOCATION	DASB102A	DASB103	DASB104	DASB104A
SAMPLE ID	DASB102A-0406-D	DASB103-0305	DASB104-0305	DASB104A-0204
SAMPLE DATE	5/25/2011	4/21/2010	4/20/2010	5/25/2011
SACODE	DUP	NORMAL	NORMAL	NORMAL
DEPTH	(4 - 6')	(3 - 5')	(3 - 5')	(2- 4')
METALS (MG/KG)				
ARSENIC	--	5	6.4	--
BARIUM	--	36	47	--
CADMIUM	--	0.19	0.17	--
CHROMIUM	--	13	16 J	--
COPPER	--	13	14	--
LEAD	--	12	16	--
MERCURY	0.29	0.031 J	--	0.15
SELENIUM	--	0.36	0.25	--
SILVER	--	0.074	0.076	--
ZINC	--	39	56	--
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	85	--	--	85
TOTAL SOLIDS (%)	--	87	86	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	2	0.019 U	--	0.028 J
ACENAPHTHENE	0.51	0.019 U	--	0.12 J
ACENAPHTHYLENE	0.18 J	0.019 U	--	0.2 U
ANTHRACENE	1 J	0.0058 J	--	0.23
BAP EQUIVALENT	2.1354	0.030473	--	0.63346
BENZO(A)ANTHRACENE	2.1 J	0.011 J	--	0.52
BENZO(A)PYRENE	1.4 J	0.017 J	--	0.41
BENZO(B)FLUORANTHENE	2.1 J	0.019	--	0.52
BENZO(G,H,I)PERYLENE	0.63 J	0.013 J	--	0.19 J
BENZO(K)FLUORANTHENE	0.94 J	0.008 J	--	0.2
CHRYSENE	2 J	0.013 J	--	0.46
DIBENZO(A,H)ANTHRACENE	0.24	0.019 U	--	0.2 U
FLUORANTHENE	3.9 J	0.024	--	1
FLUORENE	1.3	0.0019 J	--	0.11 J
INDENO(1,2,3-CD)PYRENE	0.64 J	0.0088 J	--	0.17 J
NAPHTHALENE	1.5	0.0016 J	--	0.028 J
PHENANTHRENE	6.1 J	0.018 J	--	0.83
PYRENE	3.9 J	0.024	--	0.9

USCG Atwater - Subsurface Soil (> 2')

Full Appendix Results

LOCATION	DASB105	DASB106	DASB106A	DASB107
SAMPLE ID	DASB105-0305	DASB106-0305	DASB106A-0204	DASB107-0204
SAMPLE DATE	4/21/2010	4/20/2010	5/25/2011	4/21/2010
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH	(3 - 5')	(3 - 5')	(2- 4')	(2- 4')
METALS (MG/KG)				
ARSENIC	8.8	5.5	--	9.4
BARIUM	66	48	--	74
CADMIUM	0.24	0.13	--	0.46
CHROMIUM	14	15 J	--	13
COPPER	60	13	--	98
LEAD	93	8.5	--	130
MERCURY	0.16	--	0.49	0.27
SELENIUM	0.34	0.1 U	--	0.36
SILVER	0.12	0.069	--	0.14
ZINC	79	38	--	160
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	86	--
TOTAL SOLIDS (%)	85	92	--	90
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.027 J	--	0.092 J	0.22
ACENAPHTHENE	0.019 J	--	0.29	0.44
ACENAPHTHYLENE	0.0074 J	--	0.096 J	0.11
ANTHRACENE	0.076 J	--	0.58	0.84
BAP EQUIVALENT	0.29617	--	3.3068	2.4278
BENZO(A)ANTHRACENE	0.22	--	3	2.6
BENZO(A)PYRENE	0.2	--	2.2	1.6
BENZO(B)FLUORANTHENE	0.25	--	3	1.9
BENZO(G,H,I)PERYLENE	0.11	--	0.78	0.83
BENZO(K)FLUORANTHENE	0.096 J	--	1.2	1.2
CHRYSENE	0.21	--	2.8	2.8
DIBENZO(A,H)ANTHRACENE	0.037 J	--	0.4	0.29
FLUORANTHENE	0.42	--	4.3	4.3
FLUORENE	0.037 J	--	0.33	0.43
INDENO(1,2,3-CD)PYRENE	0.11	--	0.92	0.73
NAPHTHALENE	0.027 J	--	0.16 J	0.22
PHENANTHRENE	0.43	--	2.5	2.8
PYRENE	0.43	--	4.4	3.3

USCG Atwater ● bsurface Soil (> 2') ● ●

Full Appendix Results

LOCATION	DASB108	DASB109	DASB109A	DASB110
SAMPLE ID	DASB108-0305	DASB109-0305	DASB109A-0204	DASB110-0305
SAMPLE DATE	4/21/2010	4/20/2010	5/25/2011	4/20/2010
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH	(3 - 5')	(3 - 5')	(2- 4')	(3 - 5')
METALS (MG/KG)				
ARSENIC	3.3	11	--	6.9
BARIUM	73	110	--	59
CADMIUM	0.15	0.65	--	2.5
CHROMIUM	12	10 J	--	14 J
COPPER	12	180	--	79
LEAD	53	2400	--	160
MERCURY	0.28	--	0.55	--
SELENIUM	0.17	2.6	--	0.54
SILVER	0.064	0.19	--	0.22
ZINC	46	260	--	210
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	--	--	81	--
TOTAL SOLIDS (%)	83	79	--	87
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.02 U	--	0.21 U	--
ACENAPHTHENE	0.02 U	--	0.21 U	--
ACENAPHTHYLENE	0.02 U	--	0.21 U	--
ANTHRACENE	0.0044 J	--	0.085 J	--
BAP EQUIVALENT	0.027548	--	0.58037	--
BENZO(A)ANTHRACENE	0.013 J	--	0.39	--
BENZO(A)PYRENE	0.013 J	--	0.37	--
BENZO(B)FLUORANTHENE	0.023	--	0.46	--
BENZO(G,H,I)PERYLENE	0.01 J	--	0.19 J	--
BENZO(K)FLUORANTHENE	0.0065 J	--	0.2 J	--
CHRYSENE	0.013 J	--	0.37	--
DIBENZO(A,H)ANTHRACENE	0.02 U	--	0.21 U	--
FLUORANTHENE	0.024	--	0.62	--
FLUORENE	0.02 U	--	0.21 U	--
INDENO(1,2,3-CD)PYRENE	0.0087 J	--	0.18 J	--
NAPHTHALENE	0.02 U	--	0.013 J	--
PHENANTHRENE	0.012 J	--	0.37	--
PYRENE	0.024	--	0.71	--

USCG Atwater - Subsurface Soil (> 2')

Full Appendix Results

LOCATION	DASB110A	DASB111	DASB111A	DASB112
SAMPLE ID	DASB110A-0305	DASB111-0305	DASB111A-0305	DASB112-0305
SAMPLE DATE	5/25/2011	4/20/2010	5/25/2011	4/20/2010
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH	(3 - 5')	(3 - 5')	(3 - 5')	(3 - 5')
METALS (MG/KG)				
ARSENIC	--	4.7	--	7.6
BARIUM	--	61	--	75
CADMIUM	--	0.14	--	0.22
CHROMIUM	--	17 J	--	19 J
COPPER	--	14	--	30
LEAD	--	11	--	94
MERCURY	0.11	--	0.05	--
SELENIUM	--	0.14	--	0.42
SILVER	--	0.085	--	0.096
ZINC	--	41	--	77
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	84	--	87	--
TOTAL SOLIDS (%)	--	89	--	84
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.0028 J	--	0.025 J	--
ACENAPHTHENE	0.0056 J	--	0.038 U	--
ACENAPHTHYLENE	0.02 U	--	0.038 U	--
ANTHRACENE	0.0084 J	--	0.0055 J	--
BAP EQUIVALENT	0.039701	--	0.029915	--
BENZO(A)ANTHRACENE	0.035	--	0.014 J	--
BENZO(A)PYRENE	0.022	--	0.0078 J	--
BENZO(B)FLUORANTHENE	0.031	--	0.01 J	--
BENZO(G,H,I)PERYLENE	0.012 J	--	0.0078 J	--
BENZO(K)FLUORANTHENE	0.0072 J	--	0.007 J	--
CHRYSENE	0.029	--	0.015 J	--
DIBENZO(A,H)ANTHRACENE	0.02 U	--	0.038 U	--
FLUORANTHENE	0.033	--	0.013 J	--
FLUORENE	0.0056 J	--	0.038 U	--
INDENO(1,2,3-CD)PYRENE	0.01 J	--	0.0063 J	--
NAPHTHALENE	0.002 J	--	0.01 J	--
PHENANTHRENE	0.023	--	0.032 J	--
PYRENE	0.059	--	0.015 J	--

USCG Atwater [redacted] bsurface Soil (> 2')

Full Appendix R[redacted]ts

LOCATION	DASB112A	DASB114	DASB115	DASB115A
SAMPLE ID	DASB112A-0204	DASB114-0305	DASB115-0305	DASB115A-0204
SAMPLE DATE	5/25/2011	4/21/2010	4/20/2010	5/25/2011
SACODE	NORMAL	NORMAL	NORMAL	NORMAL
DEPTH	(2 - 4')	(3 - 5')	(3 - 5')	(2 - 4')
METALS (MG/KG)				
ARSENIC	--	17	5.5	--
BARIUM	--	150	95	--
CADMIUM	--	0.47	0.25	--
CHROMIUM	--	16	16 J	--
COPPER	--	65	26	--
LEAD	--	760	140	--
MERCURY	0.49	0.69	--	1.3
SELENIUM	--	1.9	0.45	--
SILVER	--	0.18	0.13	--
ZINC	--	230	110	--
MISCELLANEOUS PARAMETERS				
PERCENT SOLIDS (%)	83	--	--	83
TOTAL SOLIDS (%)	--	83	87	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)				
2-METHYLNAPHTHALENE	0.0095 J	0.069 J	--	0.041 J
ACENAPHTHENE	0.04 U	0.018 J	--	0.12 J
ACENAPHTHYLENE	0.04 U	0.011 J	--	0.2 U
ANTHRACENE	0.013 J	0.077 J	--	0.31
BAP EQUIVALENT	0.125785	0.40812	--	0.97648
BENZO(A)ANTHRACENE	0.086	0.25	--	0.76
BENZO(A)PYRENE	0.081	0.28	--	0.67
BENZO(B)FLUORANTHENE	0.11	0.34	--	0.95
BENZO(G,H,I)PERYLENE	0.052	0.2	--	0.33
BENZO(K)FLUORANTHENE	0.031 J	0.084 J	--	0.28
CHRYSENE	0.075	0.28	--	0.68
DIBENZO(A,H)ANTHRACENE	0.04 U	0.1 U	--	0.2 U
FLUORANTHENE	0.11	0.42	--	1.4
FLUORENE	0.04 U	0.022 J	--	0.095 J
INDENO(1,2,3-CD)PYRENE	0.048	0.18	--	0.32
NAPHTHALENE	0.0055 J	0.045 J	--	0.033 J
PHENANTHRENE	0.069	0.27	--	1.1
PYRENE	0.14	0.45	--	1.5

USCG Atwater - Subsurface Soil (> 2') Full Appendix Results

Footnotes:

-- = The chemical was not analyzed or the data were not used in the risk assessment.

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

USCG Atwater [redacted] oundwater

Full Appendix Results

LOCATION	DAMW01	DAMW02	DAMW03	DAMW03
SAMPLE ID	DA-GW-01-062011	DA-GW-02-062011	DA-GW-03-062011	DA-GW-03-062011-AVG
SAMPLE DATE	6/6/2011	6/6/2011	6/6/2011	6/6/2011
METALS (UG/L)				
ARSENIC	1.5 J	6.2	2.6 J	2.55
BARIUM	210	150	290	290
CADMIUM	0.2 U	0.2 U	0.2 U	0.20 U
CHROMIUM	0.31 J	0.33 J	0.29 J	0.28
COPPER	0.74 J	1.2	0.77 J	0.77 J
LEAD	0.73 J	0.85 J	0.47 J	0.40
MERCURY	0.2 U	0.2 U	0.2 U	0.20 U
SELENIUM	5 UJ	1 J	5 UJ	5 U
SILVER	0.5 U	0.5 U	0.5 U	0.50 U
ZINC	6.9 J	3.9 J	8.5 J	6.55
DISSOLVED METALS (UG/L)				
ARSENIC	0.95 J	1 J	2.7 J	2.7
BARIUM	190 J	200 J	310 J	305
CADMIUM	0.2 U	0.2 U	0.2 U	0.20 U
CHROMIUM	0.3 J	0.47 J	0.21 J	0.21 J
COPPER	0.44 J	0.42 J	1 U	1 U
LEAD	0.17 J	0.2 J	1 U	1 U
MERCURY	0.2 U	0.2 U	0.2 U	0.20 U
SELENIUM	5 UJ	5 UJ	5 UJ	5 U
SILVER	0.5 U	0.5 U	0.5 U	0.50 U
ZINC	5.5	5 U	4.2 J	4.05
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)				
2-METHYLNAPHTHALENE	0.5 U	24 J	0.07 J	0.07 J
ACENAPHTHENE	0.5 U	6 J	1.6	1.6
ACENAPHTHYLENE	0.5 U	1.7 J	0.05 J	0.05 J
ANTHRACENE	0.5 U	3.8 J	0.22 J	0.205
BENZO(A)ANTHRACENE	0.5 U	0.28 J	0.5 U	0.50 U
BENZO(A)PYRENE	0.5 U	0.5 UJ	0.5 U	0.50 U
BENZO(B)FLUORANTHENE	0.5 U	0.5 UJ	0.5 U	0.50 U
BENZO(G,H,I)PERYLENE	0.5 U	0.5 UJ	0.5 U	0.50 U
BENZO(K)FLUORANTHENE	0.5 U	0.05 J	0.5 U	0.50 U
CHRYSENE	0.5 U	0.1 J	0.5 U	0.50 U
DIBENZO(A,H)ANTHRACENE	0.5 U	0.5 UJ	0.5 U	0.50 U
FLUORANTHENE	0.5 U	0.52 J	0.2 J	0.175
FLUORENE	0.5 U	3.5 J	0.36 J	0.315
INDENO(1,2,3-CD)PYRENE	0.5 U	0.5 UJ	0.5 U	0.50 U
NAPHTHALENE	0.5 U	120	0.19 J	0.15
PHENANTHRENE	0.5 U	8.8 J	1.2	1.1
PYRENE	0.5 U	0.39 J	0.15 J	0.14

USCG Atwater - Groundwater

Full Appendix Results

LOCATION	DAMW03	DAMW04
SAMPLE ID	DA-GW-03-062011-D	DA-GW-04-062011
SAMPLE DATE	6/6/2011	6/6/2011
METALS (UG/L)		
ARSENIC	2.5 J	3 J
BARIUM	290	150
CADMIUM	0.2 U	0.2 U
CHROMIUM	0.27 J	0.36 J
COPPER	1 U	2.6
LEAD	0.33 J	2.1
MERCURY	0.2 U	0.2 U
SELENIUM	5 UJ	5 UJ
SILVER	0.5 U	0.5 U
ZINC	4.6 J	110 J
DISSOLVED METALS (UG/L)		
ARSENIC	2.7 J	3 J
BARIUM	300 J	150 J
CADMIUM	0.2 U	0.2 U
CHROMIUM	1 U	1 U
COPPER	1 U	0.88 J
LEAD	1 U	0.44 J
MERCURY	0.2 U	0.2 U
SELENIUM	5 UJ	5 UJ
SILVER	0.5 U	0.5 U
ZINC	3.9 J	110
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)		
2-METHYLNAPHTHALENE	0.5 U	0.5 U
ACENAPHTHENE	1.6	0.05 J
ACENAPHTHYLENE	0.5 U	0.5 U
ANTHRACENE	0.19 J	0.5 U
BENZO(A)ANTHRACENE	0.5 U	0.5 U
BENZO(A)PYRENE	0.5 U	0.5 U
BENZO(B)FLUORANTHENE	0.5 U	0.5 U
BENZO(G,H,I)PERYLENE	0.5 U	0.5 U
BENZO(K)FLUORANTHENE	0.5 U	0.5 U
CHRYSENE	0.5 U	0.5 U
DIBENZO(A,H)ANTHRACENE	0.5 U	0.5 U
FLUORANTHENE	0.15 J	0.5 U
FLUORENE	0.27 J	0.5 U
INDENO(1,2,3-CD)PYRENE	0.5 U	0.5 U
NAPHTHALENE	0.11 J	0.05 J
PHENANTHRENE	1	0.05 J
PYRENE	0.13 J	0.04 J

USCG Atwater [redacted]undwater
Footnotes:

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

ATTACHMENT 2

DETECTED CONCENTRATIONS SUMMARIES

USCG Atwater [redacted]face Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS101 DASS101-0002 4/21/2010 NORMAL 0 - 2'	DASS102 DASS102-0002 4/20/2010 NORMAL 0 - 2'	DASS102A DASS102A-0002 5/25/2011 ORIG 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	5.7	5.7	--
BARIUM	15000	N	37000	59	56	--
CADMIUM	70	N	550	0.28	0.27	--
CHROMIUM[3]	0.29	C	2500	15	14 J	--
COPPER	3100	N	20000	16	16	--
LEAD	400		400	31	34	--
MERCURY[4]	23	N	160	0.062	--	0.053
SELENIUM	390	N	2600	0.28	0.18	--
SILVER	390	N	2500	0.079	0.072	--
ZINC	23000	N	170000	62	62	--
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	--	87
TOTAL SOLIDS (%)	--		--	88	87	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.0045 J	--	0.27
ACENAPHTHENE	3400	N	41000	0.013 J	--	0.12 J
ACENAPHTHYLENE[5]	3400	N	1600	0.0071 J	--	0.19 U
ANTHRACENE	17000	N	230000	0.059	--	0.25 J
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	0.22	--	0.63
BENZO(A)ANTHRACENE	0.15	C	20	0.18	--	0.54 J
BENZO(A)PYRENE	0.015	C	2	0.15	--	0.4 J
BENZO(B)FLUORANTHENE	0.15	C	20	0.2	--	0.58 J
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.11	--	0.22
BENZO(K)FLUORANTHENE	1.5	C	200	0.069	--	0.18 J
CHRYSENE	15	C	2000	0.17	--	0.58 J
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.026	--	0.19 U
FLUORANTHENE	2300	N	46000	0.37	--	1
FLUORENE	2300	N	27000	0.018 J	--	0.22
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.098	--	0.19
NAPHTHALENE	3.6	C	16000	0.0058 J	--	0.2
PHENANTHRENE[6]	1700	N	1600	0.21	--	1.2 J
PYRENE	1700	N	29000	0.3	--	0.97 J

JSCG Atwater - Surface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS102A DASS102A-0002-AVG 5/25/2011 AVG 0 - 2'	DASS102A DASS102A-0002-D 5/25/2011 DUP 0 - 2'	DASS103 DASS103-0002 4/21/2010 NORMAL 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	--	--	6.8
BARIUM	15000	N	37000	--	--	49
CADMIUM	70	N	550	--	--	0.18
CHROMIUM[3]	0.29	C	2500	--	--	13
COPPER	3100	N	20000	--	--	14
LEAD	400		400	--	--	43
MERCURY[4]	23	N	160	0.0675	0.082	0.044 J
SELENIUM	390	N	2600	--	--	0.25
SILVER	390	N	2500	--	--	0.085
ZINC	23000	N	170000	--	--	45
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	87	87	--
TOTAL SOLIDS (%)	--		--	--	--	92
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.141	0.012 J	0.0031 J
ACENAPHTHENE	3400	N	41000	0.083	0.046 J	0.008 J
ACENAPHTHYLENE[5]	3400	N	1600	0.19 U	0.19 U	0.0088 J
ANTHRACENE	17000	N	230000	0.175	0.1 J	0.029
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	0.54	0.45	0.22
BENZO(A)ANTHRACENE	0.15	C	20	0.43	0.32 J	0.16
BENZO(A)PYRENE	0.015	C	2	0.34	0.28	0.14
BENZO(B)FLUORANTHENE	0.15	C	20	0.445	0.31 J	0.21
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.185	0.15 J	0.092
BENZO(K)FLUORANTHENE	1.5	C	200	0.17	0.16 J	0.071
CHRYSENE	15	C	2000	0.435	0.29 J	0.17
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.19 U	0.19 U	0.031
FLUORANTHENE	2300	N	46000	0.8	0.6	0.32
FLUORENE	2300	N	27000	0.133	0.046 J	0.011 J
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.17	0.15 J	0.083
NAPHTHALENE	3.6	C	16000	0.1135	0.027 J	0.0024 J
PHENANTHRENE[6]	1700	N	1600	0.815	0.43 J	0.18
PYRENE	1700	N	29000	0.765	0.56 J	0.28

USCG Atwater [redacted] rface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS104 DASS104-0002 4/20/2010 NORMAL 0 - 2'	DASS104A DASS104A-0002 5/25/2011 NORMAL 0 - 2'	DASS105 DASS105-0002 4/21/2010 NORMAL 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	11	--	6.6
BARIUM	15000	N	37000	110	--	74
CADMIUM	70	N	550	0.79	--	0.3
CHROMIUM[3]	0.29	C	2500	18 J	--	17
COPPER	3100	N	20000	79	--	29
LEAD	400		400	360	--	85
MERCURY[4]	23	N	160	--	0.19	0.24
SELENIUM	390	N	2600	0.5	--	0.18
SILVER	390	N	2500	0.15	--	0.1
ZINC	23000	N	170000	270	--	87
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	88	--
TOTAL SOLIDS (%)	--		--	85	--	88
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	0.19 U	4.3
ACENAPHTHENE	3400	N	41000	--	0.049 J	0.98
ACENAPHTHYLENE[5]	3400	N	1600	--	0.049 J	0.73 J
ANTHRACENE	17000	N	230000	--	0.22	2.1
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	--	1.6	4.2
BENZO(A)ANTHRACENE	0.15	C	20	--	1.4	3.7
BENZO(A)PYRENE	0.015	C	2	--	1.2	2.9
BENZO(B)FLUORANTHENE	0.15	C	20	--	1.3	3.2
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	0.51	1.5
BENZO(K)FLUORANTHENE	1.5	C	200	--	0.69	2.3
CHRYSENE	15	C	2000	--	1.1	3.8
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	0.19 U	0.95 U
FLUORANTHENE	2300	N	46000	--	1.9	8.4
FLUORENE	2300	N	27000	--	0.046 J	2.2
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	0.55	1.2
NAPHTHALENE	3.6	C	16000	--	0.023 J	3
PHENANTHRENE[6]	1700	N	1600	--	0.68	13
PYRENE	1700	N	29000	--	2.1	8.2

USCG Atwater - Surface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS106 DASS106-0002 4/20/2010 NORMAL 0 - 2'	DASS106A DASS106A-0002 5/25/2011 NORMAL 0 - 2'	DASS107 DASS107-0002 4/21/2010 NORMAL 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	6.4	--	8.7
BARIUM	15000	N	37000	75	--	65
CADMIUM	70	N	550	0.33	--	0.57
CHROMIUM[3]	0.29	C	2500	14 J	--	16
COPPER	3100	N	20000	49	--	130
LEAD	400		400	99	--	190
MERCURY[4]	23	N	160	--	0.043 J	0.11
SELENIUM	390	N	2600	0.78	--	0.32
SILVER	390	N	2500	0.11	--	0.078
ZINC	23000	N	170000	88	--	130
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	84	--
TOTAL SOLIDS (%)	--		--	87	--	89
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	0.2 U	0.015 J
ACENAPHTHENE	3400	N	41000	--	0.2 U	0.02 J
ACENAPHTHYLENE[5]	3400	N	1600	--	0.2 U	0.022 J
ANTHRACENE	17000	N	230000	--	0.14 J	0.082 J
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	--	0.48	0.33
BENZO(A)ANTHRACENE	0.15	C	20	--	0.4	0.3
BENZO(A)PYRENE	0.015	C	2	--	0.29	0.23
BENZO(B)FLUORANTHENE	0.15	C	20	--	0.39	0.36 J
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	0.12 J	0.14
BENZO(K)FLUORANTHENE	1.5	C	200	--	0.14 J	0.057 J
CHRYSENE	15	C	2000	--	0.35	0.27
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	0.2 U	0.021 J
FLUORANTHENE	2300	N	46000	--	0.74	0.5
FLUORENE	2300	N	27000	--	0.2 U	0.026 J
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	0.12 J	0.17
NAPHTHALENE	3.6	C	16000	--	0.2 U	0.01 J
PHENANTHRENE[8]	1700	N	1600	--	0.48	0.31
PYRENE	1700	N	29000	--	0.76	0.53

USCG Atwater [redacted]face Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS108 DASS108-0002 4/21/2010 NORMAL 0 - 2'	DASS109 DASS109-0002 4/20/2010 ORIG 0 - 2'	DASS109 DASS109-0002-AVG 4/20/2010 AVG 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	2.5	9.2	9.05
BARIUM	15000	N	37000	26	150	140
CADMIUM	70	N	550	0.16	0.45	0.45
CHROMIUM[3]	0.29	C	2500	10	12 J	13
COPPER	3100	N	20000	8.7	71	69
LEAD	400		400	11	450	400
MERCURY[4]	23	N	160	0.018 J	--	--
SELENIUM	390	N	2600	0.1 U	0.59	0.58
SILVER	390	N	2500	0.045 J	0.13	0.12
ZINC	23000	N	170000	31	200	195
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	--	--
TOTAL SOLIDS (%)	--		--	93	92	91
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.036 U	--	--
ACENAPHTHENE	3400	N	41000	0.036 U	--	--
ACENAPHTHYLENE[5]	3400	N	1600	0.0033 J	--	--
ANTHRACENE	17000	N	230000	0.013 J	--	--
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	0.10	--	--
BENZO(A)ANTHRACENE	0.15	C	20	0.057	--	--
BENZO(A)PYRENE	0.015	C	2	0.067	--	--
BENZO(B)FLUORANTHENE	0.15	C	20	0.065	--	--
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.044	--	--
BENZO(K)FLUORANTHENE	1.5	C	200	0.045	--	--
CHRYSENE	15	C	2000	0.053	--	--
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.036 U	--	--
FLUORANTHENE	2300	N	46000	0.081	--	--
FLUORENE	2300	N	27000	0.0038 J	--	--
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.036	--	--
NAPHTHALENE	3.6	C	16000	0.036 U	--	--
PHENANTHRENE[6]	1700	N	1600	0.051	--	--
PYRENE	1700	N	29000	0.076	--	--

USCG Atwater - Surface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS109 DASS109-0002-D 4/20/2010 DUP 0 - 2'	DASS109A DASS109A-0002 5/25/2011 NORMAL 0 - 2'	DASS110 DASS110-0002 4/20/2010 NORMAL 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	8.9	--	8.1
BARIUM	15000	N	37000	130	--	140
CADMIUM	70	N	550	0.45	--	1.3
CHROMIUM[3]	0.29	C	2500	14 J	--	11 J
COPPER	3100	N	20000	67	--	220
LEAD	400		400	350	--	480
MERCURY[4]	23	N	160	--	0.031 J	--
SELENIUM	390	N	2600	0.57	--	0.57
SILVER	390	N	2500	0.11	--	0.23
ZINC	23000	N	170000	190	--	660
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	95	--
TOTAL SOLIDS (%)	--		--	90	--	91
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	1.8 U	--
ACENAPHTHENE	3400	N	41000	--	1.8 U	--
ACENAPHTHYLENE[5]	3400	N	1600	--	1.8 U	--
ANTHRACENE	17000	N	230000	--	1.8 U	--
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	--	1.6	--
BENZO(A)ANTHRACENE	0.15	C	20	--	0.58 J	--
BENZO(A)PYRENE	0.015	C	2	--	0.45 J	--
BENZO(B)FLUORANTHENE	0.15	C	20	--	0.55 J	--
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	0.24 J	--
BENZO(K)FLUORANTHENE	1.5	C	200	--	0.21 J	--
CHRYSENE	15	C	2000	--	0.48 J	--
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	1.8 U	--
FLUORANTHENE	2300	N	46000	--	0.58 J	--
FLUORENE	2300	N	27000	--	1.8 U	--
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	1.8 U	--
NAPHTHALENE	3.6	C	16000	--	1.8 U	--
PHENANTHRENE[6]	1700	N	1600	--	0.55 J	--
PYRENE	1700	N	29000	--	1.8	--

USCG Atwater [redacted]rface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS110A DASS110A-0002 5/25/2011 NORMAL 0 - 2'	DASS111 DASS111-0002 4/20/2010 ORIG 0 - 2'	DASS111 DASS111-0002-AVG 4/20/2010 AVG 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	--	7.6	7.9
BARIUM	15000	N	37000	--	110	125
CADMIUM	70	N	550	--	0.86	0.825
CHROMIUM[3]	0.29	C	2500	--	13 J	12.5
COPPER	3100	N	20000	--	190	205
LEAD	400		400	--	370	340
MERCURY[4]	23	N	160	0.37	--	--
SELENIUM	390	N	2600	--	0.5	0.525
SILVER	390	N	2500	--	0.2	0.185
ZINC	23000	N	170000	--	450 J	360
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	88	--	--
TOTAL SOLIDS (%)	--		--	--	91	91
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.019 J	--	--
ACENAPHTHENE	3400	N	41000	0.19 U	--	--
ACENAPHTHYLENE[5]	3400	N	1600	0.19 U	--	--
ANTHRACENE	17000	N	230000	0.075 J	--	--
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	0.66	--	--
BENZO(A)ANTHRACENE	0.15	C	20	0.47	--	--
BENZO(A)PYRENE	0.015	C	2	0.44	--	--
BENZO(B)FLUORANTHENE	0.15	C	20	0.6	--	--
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.22	--	--
BENZO(K)FLUORANTHENE	1.5	C	200	0.22	--	--
CHRYSENE	15	C	2000	0.45	--	--
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.19 U	--	--
FLUORANTHENE	2300	N	46000	0.8	--	--
FLUORENE	2300	N	27000	0.19 U	--	--
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.2	--	--
NAPHTHALENE	3.6	C	16000	0.023 J	--	--
PHENANTHRENE[6]	1700	N	1600	0.33	--	--
PYRENE	1700	N	29000	0.8	--	--

USCG Atwater - Surface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS111 DASS111-0002-D 4/20/2010 DUP 0 - 2'	DASS111A DASS111A-0002 5/25/2011 NORMAL 0 - 2'	DASS112 DASS112-0002 4/20/2010 NORMAL 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	8.2	--	19
BARIUM	15000	N	37000	140	--	420
CADMIUM	70	N	550	0.79	--	2.6
CHROMIUM[3]	0.29	C	2500	12 J	--	15 J
COPPER	3100	N	20000	220	--	620
LEAD	400		400	310	--	970
MERCURY[4]	23	N	160	--	0.64	--
SELENIUM	390	N	2600	0.55	--	0.6
SILVER	390	N	2500	0.17	--	0.28
ZINC	23000	N	170000	270 J	--	670
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	88	--
TOTAL SOLIDS (%)	--		--	91	--	89
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	0.056 J	--
ACENAPHTHENE	3400	N	41000	--	0.24	--
ACENAPHTHYLENE[5]	3400	N	1600	--	0.089 J	--
ANTHRACENE	17000	N	230000	--	0.69	--
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	--	3.3	--
BENZO(A)ANTHRACENE	0.15	C	20	--	2.6	--
BENZO(A)PYRENE	0.015	C	2	--	2.3	--
BENZO(B)FLUORANTHENE	0.15	C	20	--	2.9	--
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	1.1	--
BENZO(K)FLUORANTHENE	1.5	C	200	--	1.3	--
CHRYSENE	15	C	2000	--	2.3	--
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	0.32	--
FLUORANTHENE	2300	N	46000	--	4.6	--
FLUORENE	2300	N	27000	--	0.23	--
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	1.2	--
NAPHTHALENE	3.6	C	16000	--	0.063 J	--
PHENANTHRENE[6]	1700	N	1600	--	3.4	--
PYRENE	1700	N	29000	--	5.1	--

USCG Atwater[redacted]rface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS112A DASS112A-0002 5/25/2011 NORMAL 0 - 2'	DASS114 DASS114-0002 4/21/2010 NORMAL 0 - 2'	DASS115 DASS115-0002 4/20/2010 ORIG 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	--	7.3	8.4
BARIUM	15000	N	37000	--	140	100
CADMIUM	70	N	550	--	0.71	0.42
CHROMIUM[3]	0.29	C	2500	--	20 J	14 J
COPPER	3100	N	20000	--	77	85
LEAD	400		400	--	410	280
MERCURY[4]	23	N	160	0.54	0.41 J	--
SELENIUM	390	N	2600	--	0.5	0.74
SILVER	390	N	2500	--	0.12	0.095
ZINC	23000	N	170000	--	210	140
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	90	--	--
TOTAL SOLIDS (%)	--		--	--	93	92
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.017 J	0.36 U	--
ACENAPHTHENE	3400	N	41000	0.01 J	0.36 U	--
ACENAPHTHYLENE[5]	3400	N	1600	0.037 U	0.36 U	--
ANTHRACENE	17000	N	230000	0.029 J	0.092 J	--
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	0.17	0.93	--
BENZO(A)ANTHRACENE	0.15	C	20	0.14	0.6	--
BENZO(A)PYRENE	0.015	C	2	0.11	0.56	--
BENZO(B)FLUORANTHENE	0.15	C	20	0.16	0.8	--
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.07	0.51	--
BENZO(K)FLUORANTHENE	1.5	C	200	0.067	0.73	--
CHRYSENE	15	C	2000	0.12	0.92	--
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.037 U	0.36 U	--
FLUORANTHENE	2300	N	46000	0.16	0.86	--
FLUORENE	2300	N	27000	0.014 J	0.36 U	--
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.064	0.37	--
NAPHTHALENE	3.6	C	16000	0.015 J	0.034 J	--
PHENANTHRENE[6]	1700	N	1600	0.13	0.36	--
PYRENE	1700	N	29000	0.25	0.8	--

USCG Atwater - Surface Soil (0 - 2') Positive Detections

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASS115 DASS115-0002-AVG 4/20/2010 AVG 0 - 2'	DASS115 DASS115-0002-D 4/20/2010 DUP 0 - 2'	DASS115A DASS115A-0002 5/25/2011 NORMAL 0 - 2'
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	8.6	8.8	--
BARIUM	15000	N	37000	105	110	--
CADMIUM	70	N	550	0.47	0.52	--
CHROMIUM[3]	0.29	C	2500	15	16 J	--
COPPER	3100	N	20000	97.5	110	--
LEAD	400		400	290	300	--
MERCURY[4]	23	N	160	--	--	0.54
SELENIUM	390	N	2600	0.74	0.74	--
SILVER	390	N	2500	0.0975	0.1	--
ZINC	23000	N	170000	160	180	--
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	--	89
TOTAL SOLIDS (%)	--		--	91.5	91	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	--	1.9 U
ACENAPHTHENE	3400	N	41000	--	--	1.9 U
ACENAPHTHYLENE[5]	3400	N	1600	--	--	1.9 U
ANTHRACENE	17000	N	230000	--	--	1.9 U
BAP EQUIVALENTS - 1/2 NON-DETECT	0.015	C	2	--	--	1.6
BENZO(A)ANTHRACENE	0.15	C	20	--	--	0.5 J
BENZO(A)PYRENE	0.015	C	2	--	--	0.46 J
BENZO(B)FLUORANTHENE	0.15	C	20	--	--	0.5 J
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	--	0.53 J
BENZO(K)FLUORANTHENE	1.5	C	200	--	--	0.42 J
CHRYSENE	15	C	2000	--	--	0.46 J
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	--	1.9 U
FLUORANTHENE	2300	N	46000	--	--	0.61 J
FLUORENE	2300	N	27000	--	--	1.9 U
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	--	1.9 U
NAPHTHALENE	3.6	C	16000	--	--	1.9 U
PHENANTHRENE[6]	1700	N	1600	--	--	0.69 J
PYRENE	1700	N	29000	--	--	1.8 J

USCG Atwater [redacted]face Soil (0 - 2') Positive Detections

Footnotes:

(1) = USEPA Regional Screening Level (RSL) for Residential Soil (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ or a hazard quotient of 1.

(2) = Michigan Department of Environmental Quality (MDEQ) Residential Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.

(3) = Critiera for hexavalent chromium were used for total chromium.

(4) = The USEPA RSL is for mercuric chloride (and other mercury salts).

(5) = The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.

(6) = The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

-- = The chemical was not analyzed or these data were not used in the risk assessment.

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

USCG Atwater - Subsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB101 DASB101-0305 4/21/2010 NORMAL (3 - 5')	DASB102 DASB102-0305 4/20/2010 NORMAL (3 - 5')	DASB102A DASB102A-0406 5/25/2011 ORIG (4 - 6')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	7.6	16	--
BARIUM	15000	N	37000	90	82	--
CADMIUM	70	N	550	0.23	0.21	--
CHROMIUM[3]	0.29	C	2500	18	14 J	--
COPPER	3100	N	20000	23	37	--
LEAD	400		400	180	140	--
MERCURY[4]	23	N	160	0.3 J	--	0.32
SELENIUM	390	N	2600	0.37	0.33	--
SILVER	390	N	2500	0.13	0.098	--
ZINC	23000	N	170000	93	90	--
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	--	88
TOTAL SOLIDS (%)	--		--	87	86	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.007 J	--	1.8
ACENAPHTHENE	3400	N	41000	0.023	--	0.38
ACENAPHTHYLENE[5]	3400	N	1600	0.017 J	--	0.13 J
ANTHRACENE	17000	N	230000	0.11	--	0.45 J
BAP EQUIVALENT	0.015	C	2	0.46	--	0.97
BENZO(A)ANTHRACENE	0.15	C	20	0.49	--	0.99 J
BENZO(A)PYRENE	0.015	C	2	0.31	--	0.66 J
BENZO(B)FLUORANTHENE	0.15	C	20	0.28	--	0.86 J
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.15	--	0.3 J
BENZO(K)FLUORANTHENE	1.5	C	200	0.23	--	0.4 J
CHRYSENE	15	C	2000	0.43	--	0.89 J
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.056	--	0.19 U
FLUORANTHENE	2300	N	46000	0.86	--	1.7 J
FLUORENE	2300	N	27000	0.024	--	0.92
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.15	--	0.27 J
NAPHTHALENE	3.6	C	16000	0.0085 J	--	1.7
PHENANTHRENE[6]	1700	N	1600	0.37	--	3.2 J
PYRENE	1700	N	29000	0.72	--	2 J

USCG Atwater [redacted] bsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB102A DASB102A-0406-AVG 5/25/2011 AVG (4 - 6')	DASB102A DASB102A-0406-D 5/25/2011 DUP (4 - 6')	DASB103 DASB103-0305 4/21/2010 NORMAL (3 - 5')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	--	--	5
BARIUM	15000	N	37000	--	--	36
CADMIUM	70	N	550	--	--	0.19
CHROMIUM[3]	0.29	C	2500	--	--	13
COPPER	3100	N	20000	--	--	13
LEAD	400		400	--	--	12
MERCURY[4]	23	N	160	0.305	0.29	0.031 J
SELENIUM	390	N	2600	--	--	0.36
SILVER	390	N	2500	--	--	0.074
ZINC	23000	N	170000	--	--	39
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	86.5	85	--
TOTAL SOLIDS (%)	--		--	--	--	87
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	1.9	2	0.019 U
ACENAPHTHENE	3400	N	41000	0.445	0.51	0.019 U
ACENAPHTHYLENE[5]	3400	N	1600	0.155	0.18 J	0.019 U
ANTHRACENE	17000	N	230000	0.725	1 J	0.0058 J
BAP EQUIVALENT	0.015	C	2	1.6	2.1	0.030
BENZO(A)ANTHRACENE	0.15	C	20	1.545	2.1 J	0.011 J
BENZO(A)PYRENE	0.015	C	2	1.03	1.4 J	0.017 J
BENZO(B)FLUORANTHENE	0.15	C	20	1.48	2.1 J	0.019
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.465	0.63 J	0.013 J
BENZO(K)FLUORANTHENE	1.5	C	200	0.67	0.94 J	0.008 J
CHRYSENE	15	C	2000	1.445	2 J	0.013 J
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.1675	0.24	0.019 U
FLUORANTHENE	2300	N	46000	2.8	3.9 J	0.024
FLUORENE	2300	N	27000	1.11	1.3	0.0019 J
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.455	0.64 J	0.0088 J
NAPHTHALENE	3.6	C	16000	1.6	1.5	0.0016 J
PHENANTHRENE[6]	1700	N	1600	4.65	6.1 J	0.018 J
PYRENE	1700	N	29000	2.95	3.9 J	0.024

USCG Atwater - Subsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB104 DASB104-0305 4/20/2010 NORMAL (3 - 5')	DASB104A DASB104A-0204 5/25/2011 NORMAL (2 - 4')	DASB105 DASB105-0305 4/21/2010 NORMAL (3 - 5')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	6.4	--	8.8
BARIUM	15000	N	37000	47	--	66
CADMIUM	70	N	550	0.17	--	0.24
CHROMIUM[3]	0.29	C	2500	16 J	--	14
COPPER	3100	N	20000	14	--	60
LEAD	400		400	16	--	93
MERCURY[4]	23	N	160	--	0.15	0.16
SELENIUM	390	N	2600	0.25	--	0.34
SILVER	390	N	2500	0.076	--	0.12
ZINC	23000	N	170000	56	--	79
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	85	--
TOTAL SOLIDS (%)	--		--	86	--	85
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	0.028 J	0.027 J
ACENAPHTHENE	3400	N	41000	--	0.12 J	0.019 J
ACENAPHTHYLENE[5]	3400	N	1600	--	0.2 U	0.0074 J
ANTHRACENE	17000	N	230000	--	0.23	0.076 J
BAP EQUIVALENT	0.015	C	2	--	0.63	0.30
BENZO(A)ANTHRACENE	0.15	C	20	--	0.52	0.22
BENZO(A)PYRENE	0.015	C	2	--	0.41	0.2
BENZO(B)FLUORANTHENE	0.15	C	20	--	0.52	0.25
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	0.19 J	0.11
BENZO(K)FLUORANTHENE	1.5	C	200	--	0.2	0.096 J
CHRYSENE	15	C	2000	--	0.46	0.21
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	0.2 U	0.037 J
FLUORANTHENE	2300	N	46000	--	1	0.42
FLUORENE	2300	N	27000	--	0.11 J	0.037 J
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	0.17 J	0.11
NAPHTHALENE	3.6	C	16000	--	0.028 J	0.027 J
PHENANTHRENE[6]	1700	N	1600	--	0.83	0.43
PYRENE	1700	N	29000	--	0.9	0.43

USCG Atwater [redacted] bsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB106 DASB106-0305 4/20/2010 NORMAL (3 - 5')	DASB106A DASB106A-0204 5/25/2011 NORMAL (2 - 4')	DASB107 DASB107-0204 4/21/2010 NORMAL (2 - 4')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	5.5	--	9.4
BARIUM	15000	N	37000	48	--	74
CADMIUM	70	N	550	0.13	--	0.46
CHROMIUM[3]	0.29	C	2500	15 J	--	13
COPPER	3100	N	20000	13	--	98
LEAD	400		400	8.5	--	130
MERCURY[4]	23	N	160	--	0.49	0.27
SELENIUM	390	N	2600	0.1 U	--	0.36
SILVER	390	N	2500	0.069	--	0.14
ZINC	23000	N	170000	38	--	160
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	86	--
TOTAL SOLIDS (%)	--		--	92	--	90
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	0.092 J	0.22
ACENAPHTHENE	3400	N	41000	--	0.29	0.44
ACENAPHTHYLENE[5]	3400	N	1600	--	0.096 J	0.11
ANTHRACENE	17000	N	230000	--	0.58	0.84
BAP EQUIVALENT	0.015	C	2	--	3.3	2.4
BENZO(A)ANTHRACENE	0.15	C	20	--	3	2.6
BENZO(A)PYRENE	0.015	C	2	--	2.2	1.6
BENZO(B)FLUORANTHENE	0.15	C	20	--	3	1.9
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	0.78	0.83
BENZO(K)FLUORANTHENE	1.5	C	200	--	1.2	1.2
CHRYSENE	15	C	2000	--	2.8	2.8
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	0.4	0.29
FLUORANTHENE	2300	N	46000	--	4.3	4.3
FLUORENE	2300	N	27000	--	0.33	0.43
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	0.92	0.73
NAPHTHALENE	3.6	C	16000	--	0.16 J	0.22
PHENANTHRENE[6]	1700	N	1600	--	2.5	2.8
PYRENE	1700	N	29000	--	4.4	3.3

USCG Atwater - Subsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB108 DASB108-0305 4/21/2010 NORMAL (3 - 5')	DASB109 DASB109-0305 4/20/2010 NORMAL (3 - 5')	DASB109A DASB109A-0204 5/25/2011 NORMAL (2 - 4')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	3.3	11	--
BARIUM	15000	N	37000	73	110	--
CADMIUM	70	N	550	0.15	0.65	--
CHROMIUM[3]	0.29	C	2500	12	10 J	--
COPPER	3100	N	20000	12	180	--
LEAD	400		400	53	2400	--
MERCURY[4]	23	N	160	0.28	--	0.55
SELENIUM	390	N	2600	0.17	2.6	--
SILVER	390	N	2500	0.064	0.19	--
ZINC	23000	N	170000	46	260	--
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	--	81
TOTAL SOLIDS (%)	--		--	83	79	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.02 U	--	0.21 U
ACENAPHTHENE	3400	N	41000	0.02 U	--	0.21 U
ACENAPHTHYLENE[5]	3400	N	1600	0.02 U	--	0.21 U
ANTHRACENE	17000	N	230000	0.0044 J	--	0.085 J
BAP EQUIVALENT	0.015	C	2	0.028	--	0.58
BENZO(A)ANTHRACENE	0.15	C	20	0.013 J	--	0.39
BENZO(A)PYRENE	0.015	C	2	0.013 J	--	0.37
BENZO(B)FLUORANTHENE	0.15	C	20	0.023	--	0.46
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.01 J	--	0.19 J
BENZO(K)FLUORANTHENE	1.5	C	200	0.0065 J	--	0.2 J
CHRYSENE	15	C	2000	0.013 J	--	0.37
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.02 U	--	0.21 U
FLUORANTHENE	2300	N	46000	0.024	--	0.62
FLUORENE	2300	N	27000	0.02 U	--	0.21 U
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.0087 J	--	0.18 J
NAPHTHALENE	3.6	C	16000	0.02 U	--	0.013 J
PHENANTHRENE[6]	1700	N	1600	0.012 J	--	0.37
PYRENE	1700	N	29000	0.024	--	0.71

USCG Atwater [redacted] bsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB110 DASB110-0305 4/20/2010 NORMAL (3 - 5')	DASB110A DASB110A-0305 5/25/2011 NORMAL (3 - 5')	DASB111 DASB111-0305 4/20/2010 NORMAL (3 - 5')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	6.9	--	4.7
BARIUM	15000	N	37000	59	--	61
CADMIUM	70	N	550	2.5	--	0.14
CHROMIUM[3]	0.29	C	2500	14 J	--	17 J
COPPER	3100	N	20000	79	--	14
LEAD	400		400	160	--	11
MERCURY[4]	23	N	160	--	0.11	--
SELENIUM	390	N	2600	0.54	--	0.14
SILVER	390	N	2500	0.22	--	0.085
ZINC	23000	N	170000	210	--	41
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	84	--
TOTAL SOLIDS (%)	--		--	87	--	89
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	--	0.0028 J	--
ACENAPHTHENE	3400	N	41000	--	0.0056 J	--
ACENAPHTHYLENE[5]	3400	N	1600	--	0.02 U	--
ANTHRACENE	17000	N	230000	--	0.0084 J	--
BAP EQUIVALENT	0.015	C	2	--	0.040	--
BENZO(A)ANTHRACENE	0.15	C	20	--	0.035	--
BENZO(A)PYRENE	0.015	C	2	--	0.022	--
BENZO(B)FLUORANTHENE	0.15	C	20	--	0.031	--
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	--	0.012 J	--
BENZO(K)FLUORANTHENE	1.5	C	200	--	0.0072 J	--
CHRYSENE	15	C	2000	--	0.029	--
DIBENZO(A,H)ANTHRACENE	0.015	C	2	--	0.02 U	--
FLUORANTHENE	2300	N	46000	--	0.033	--
FLUORENE	2300	N	27000	--	0.0056 J	--
INDENO(1,2,3-CD)PYRENE	0.15	C	20	--	0.01 J	--
NAPHTHALENE	3.6	C	16000	--	0.002 J	--
PHENANTHRENE[6]	1700	N	1600	--	0.023	--
PYRENE	1700	N	29000	--	0.059	--

USCG Atwater - Subsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB111A DASB111A-0305 5/25/2011 NORMAL (3 - 5')	DASB112 DASB112-0305 4/20/2010 NORMAL (3 - 5')	DASB112A DASB112A-0204 5/25/2011 NORMAL (2 - 4')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	--	7.6	--
BARIUM	15000	N	37000	--	75	--
CADMIUM	70	N	550	--	0.22	--
CHROMIUM[3]	0.29	C	2500	--	19 J	--
COPPER	3100	N	20000	--	30	--
LEAD	400		400	--	94	--
MERCURY[4]	23	N	160	0.05	--	0.49
SELENIUM	390	N	2600	--	0.42	--
SILVER	390	N	2500	--	0.096	--
ZINC	23000	N	170000	--	77	--
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	87	--	83
TOTAL SOLIDS (%)	--		--	--	84	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.025 J	--	0.0095 J
ACENAPHTHENE	3400	N	41000	0.038 U	--	0.04 U
ACENAPHTHYLENE[5]	3400	N	1600	0.038 U	--	0.04 U
ANTHRACENE	17000	N	230000	0.0055 J	--	0.013 J
BAP EQUIVALENT	0.015	C	2	0.030	--	0.13
BENZO(A)ANTHRACENE	0.15	C	20	0.014 J	--	0.086
BENZO(A)PYRENE	0.015	C	2	0.0078 J	--	0.081
BENZO(B)FLUORANTHENE	0.15	C	20	0.01 J	--	0.11
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.0078 J	--	0.052
BENZO(K)FLUORANTHENE	1.5	C	200	0.007 J	--	0.031 J
CHRYSENE	15	C	2000	0.015 J	--	0.075
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.038 U	--	0.04 U
FLUORANTHENE	2300	N	46000	0.013 J	--	0.11
FLUORENE	2300	N	27000	0.038 U	--	0.04 U
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.0063 J	--	0.048
NAPHTHALENE	3.6	C	16000	0.01 J	--	0.0055 J
PHENANTHRENE[6]	1700	N	1600	0.032 J	--	0.069
PYRENE	1700	N	29000	0.015 J	--	0.14

USCG Atwater [redacted] ubsurface Soil (> 2')

LOCATION SAMPLE ID SAMPLE DATE SACODE DEPTH	USEPA RSL FOR RESIDENTIAL SOIL[1]		MDEQ SOIL DIRECT CONTACT CLEANUP CRITERION[2]	DASB114 DASB114-0305 4/21/2010 NORMAL (3 - 5')	DASB115 DASB115-0305 4/20/2010 NORMAL (3 - 5')	DASB115A DASB115A-0204 5/25/2011 NORMAL (2 - 4')
METALS (MG/KG)						
ARSENIC	0.39	C	7.6	17	5.5	--
BARIUM	15000	N	37000	150	95	--
CADMIUM	70	N	550	0.47	0.25	--
CHROMIUM[3]	0.29	C	2500	16	16 J	--
COPPER	3100	N	20000	65	26	--
LEAD	400		400	760	140	--
MERCURY[4]	23	N	160	0.69	--	1.3
SELENIUM	390	N	2600	1.9	0.45	--
SILVER	390	N	2500	0.18	0.13	--
ZINC	23000	N	170000	230	110	--
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	--		--	--	--	83
TOTAL SOLIDS (%)	--		--	83	87	--
POLYCYCLIC AROMATIC HYDROCARBONS (MG/KG)						
2-METHYLNAPHTHALENE	310	N	8100	0.069 J	--	0.041 J
ACENAPHTHENE	3400	N	41000	0.018 J	--	0.12 J
ACENAPHTHYLENE[5]	3400	N	1600	0.011 J	--	0.2 U
ANTHRACENE	17000	N	230000	0.077 J	--	0.31
BAP EQUIVALENT	0.015	C	2	0.41	--	0.98
BENZO(A)ANTHRACENE	0.15	C	20	0.25	--	0.76
BENZO(A)PYRENE	0.015	C	2	0.28	--	0.67
BENZO(B)FLUORANTHENE	0.15	C	20	0.34	--	0.95
BENZO(G,H,I)PERYLENE[6]	1700	N	2500	0.2	--	0.33
BENZO(K)FLUORANTHENE	1.5	C	200	0.084 J	--	0.28
CHRYSENE	15	C	2000	0.28	--	0.68
DIBENZO(A,H)ANTHRACENE	0.015	C	2	0.1 U	--	0.2 U
FLUORANTHENE	2300	N	46000	0.42	--	1.4
FLUORENE	2300	N	27000	0.022 J	--	0.095 J
INDENO(1,2,3-CD)PYRENE	0.15	C	20	0.18	--	0.32
NAPHTHALENE	3.6	C	16000	0.045 J	--	0.033 J
PHENANTHRENE[6]	1700	N	1600	0.27	--	1.1
PYRENE	1700	N	29000	0.45	--	1.5

USCG Atwater - Subsurface Soil (> 2') Positive Detections

Footnotes:

(1) = USEPA Regional Screening Level (RSL) for Residential Soil (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ or a hazard quotient of 1.

(2) = Michigan Department of Environmental Quality (MDEQ) Residential Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.

(3) = Critiera for hexavalent chromium were used for total chromium.

(4) = The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.

(5) = The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

-- = The chemical was not analyzed or the data were not used in the risk assessment.

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

USCG Atwater [redacted] oundwater Positive Detections

LOCATION SAMPLE ID SACODE SAMPLE DATE	USEPA RSL FOR TAP WATER[1]	MDEQ RESIDENTIAL GROUNDWATER CLEANUP CRITERION[2]	DAMW01 DA-GW-01-062011 NORMAL 6/6/2011	DAMW02 DA-GW-02-062011 NORMAL 6/6/2011
METALS (UG/L)				
ARSENIC	0.045 C	10	1.5 J	6.2
BARIUM	7300 N	2000	210	150
CHROMIUM[3]	0.043 C	100	0.31 J	0.33 J
COPPER	1500 N	1000	0.74 J	1.2
LEAD[4]	15	4	0.73 J	0.85 J
SELENIUM	180 N	50	5 UJ	1 J
ZINC	11000 N	2400	6.9 J	3.9 J
DISSOLVED METALS (UG/L)				
ARSENIC	0.045 C	10	0.95 J	1 J
BARIUM	7300 N	2000	190 J	200 J
CHROMIUM[3]	0.043 C	100	0.3 J	0.47 J
COPPER	1500 N	1000	0.44 J	0.42 J
LEAD[4]	15	4	0.17 J	0.2 J
SELENIUM	180 N	50	5 UJ	5 UJ
ZINC	11000 N	2400	5.5	5 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)				
2-METHYLNAPHTHALENE	150 N	260	0.5 U	24 J
ACENAPHTHENE	2200 N	1300	0.5 U	6 J
ACENAPHTHYLENE[5]	2200 N	52	0.5 U	1.7 J
ANTHRACENE	11000 N	43	0.5 U	3.8 J
BENZO(A)ANTHRACENE	0.029 C	2.1	0.5 U	0.28 J
BENZO(A)PYRENE EQUIVALENTS	0.0029 C	5	0.5 U	0.029
BENZO(K)FLUORANTHENE	0.29 C	0.8	0.5 U	0.05 J
CHRYSENE	2.9 C	1.6	0.5 U	0.1 J
FLUORANTHENE	1500 N	210	0.5 U	0.52 J
FLUORENE	1500 N	880	0.5 U	3.5 J
NAPHTHALENE	0.14 C	520	0.5 U	120
PHENANTHRENE[6]	1100 N	52	0.5 U	8.8 J
PYRENE	1100 N	140	0.5 U	0.39 J

USCG Atwater - Groundwater Positive Detections

LOCATION SAMPLE ID SACODE SAMPLE DATE	USEPA RSL FOR TAP WATER[1]	MDEQ RESIDENTIAL GROUNDWATER CLEANUP CRITERION[2]	DAMW03 DA-GW-03-062011 ORIG 6/6/2011	DAMW03 DA-GW-03-062011-AVG AVG 6/6/2011
METALS (UG/L)				
ARSENIC	0.045 C	10	2.6 J	2.55
BARIUM	7300 N	2000	290	290
CHROMIUM[3]	0.043 C	100	0.29 J	0.28
COPPER	1500 N	1000	0.77 J	0.77 J
LEAD[4]	15	4	0.47 J	0.4
SELENIUM	180 N	50	5 UJ	5 U
ZINC	11000 N	2400	8.5 J	6.55
DISSOLVED METALS (UG/L)				
ARSENIC	0.045 C	10	2.7 J	2.7
BARIUM	7300 N	2000	310 J	305
CHROMIUM[3]	0.043 C	100	0.21 J	0.21 J
COPPER	1500 N	1000	1 U	1 U
LEAD[4]	15	4	1 U	1 U
SELENIUM	180 N	50	5 UJ	5 U
ZINC	11000 N	2400	4.2 J	4.05
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)				
2-METHYLNAPHTHALENE	150 N	260	0.07 J	0.07 J
ACENAPHTHENE	2200 N	1300	1.6	1.6
ACENAPHTHYLENE[5]	2200 N	52	0.05 J	0.05 J
ANTHRACENE	11000 N	43	0.22 J	0.205
BENZO(A)ANTHRACENE	0.029 C	2.1	0.5 U	0.50 U
BENZO(A)PYRENE EQUIVALENTS	0.0029 C	5	0.5 U	0.5 U
BENZO(K)FLUORANTHENE	0.29 C	0.8	0.5 U	0.50 U
CHRYSENE	2.9 C	1.6	0.5 U	0.50 U
FLUORANTHENE	1500 N	210	0.2 J	0.175
FLUORENE	1500 N	880	0.36 J	0.315
NAPHTHALENE	0.14 C	520	0.19 J	0.15
PHENANTHRENE[6]	1100 N	52	1.2	1.1
PYRENE	1100 N	140	0.15 J	0.14

USCG Atwater [redacted]undwater Positive Detections

LOCATION SAMPLE ID SACODE SAMPLE DATE	USEPA RSL FOR TAP WATER[1]	MDEQ RESIDENTIAL GROUNDWATER CLEANUP CRITERION[2]	DAMW03 DA-GW-03-062011-D DUP 6/6/2011	DAMW04 DA-GW-04-062011 NORMAL 6/6/2011
METALS (UG/L)				
ARSENIC	0.045 C	10	2.5 J	3 J
BARIUM	7300 N	2000	290	150
CHROMIUM[3]	0.043 C	100	0.27 J	0.36 J
COPPER	1500 N	1000	1 U	2.6
LEAD[4]	15	4	0.33 J	2.1
SELENIUM	180 N	50	5 UJ	5 UJ
ZINC	11000 N	2400	4.6 J	110 J
DISSOLVED METALS (UG/L)				
ARSENIC	0.045 C	10	2.7 J	3 J
BARIUM	7300 N	2000	300 J	150 J
CHROMIUM[3]	0.043 C	100	1 U	1 U
COPPER	1500 N	1000	1 U	0.88 J
LEAD[4]	15	4	1 U	0.44 J
SELENIUM	180 N	50	5 UJ	5 UJ
ZINC	11000 N	2400	3.9 J	110
POLYCYCLIC AROMATIC HYDROCARBONS (UG/L)				
2-METHYLNAPHTHALENE	150 N	260	0.5 U	0.5 U
ACENAPHTHENE	2200 N	1300	1.6	0.05 J
ACENAPHTHYLENE[5]	2200 N	52	0.5 U	0.5 U
ANTHRACENE	11000 N	43	0.19 J	0.5 U
BENZO(A)ANTHRACENE	0.029 C	2.1	0.5 U	0.5 U
BENZO(A)PYRENE EQUIVALENTS	0.0029 C	5	0.5 U	0.5 U
BENZO(K)FLUORANTHENE	0.29 C	0.8	0.5 U	0.5 U
CHRYSENE	2.9 C	1.6	0.5 U	0.5 U
FLUORANTHENE	1500 N	210	0.15 J	0.5 U
FLUORENE	1500 N	880	0.27 J	0.5 U
NAPHTHALENE	0.14 C	520	0.11 J	0.05 J
PHENANTHRENE[6]	1100 N	52	1	0.05 J
PYRENE	1100 N	140	0.13 J	0.04 J

USCG Atwater - Groundwater Positive Detections

Footnotes:

(1) = USEPA Regional Screening Level (RSL) for Tap Water (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ for carcinogens (C) or a hazard quotient of 1 for non-carcinogens (N).

(2) = Michigan Department of Environmental Quality (MDEQ) Residential Groundwater Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.

(3) = Critiera for hexavalent chromium were used for total chromium.

(4) = The USEPA Maximum Contaminant Level (MCL) is presented for the RSL.

(5) = The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.

(6) = The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

-- = The chemical was not analyzed or these data were not used in the risk assessment.

Data Qualifiers:

Blank (i.e., no qualifier) = the chemical was detected.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

ATTACHMENT 3

RAGS PART D TABLES

RAGS Part D Table 1

Selection of Exposure Pathways

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs in surface soil during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Ingestion	Quant	Industrial workers may contact surface soil while at the site.
						Dermal	Quant	
				Recreational Users	Child	Ingestion	Quant	Recreational users may be exposed to COPCs in surface soil while at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents may be exposed to COPCs in surface soil while living at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
		Air	*USCG Atwater*	Construction Workers	*Adult*	*Inhalation*	*Quant*	*Construction workers may be exposed to COPCs in fuguitive dust/volatile emissions from* surface soil during excavation activities.
				Industrial Workers	Adult	Inhalation	Quant	Industrial workers may be exposed to COPCs in fuguitive dust/volatile emissions from surface soil while at the site.
				Recreational Users	Child	Inhalation	Quant	Recreational users may be exposed to COPCs in fugitive dust/volatile emissions from surface soil while at the site.
					Adult	Inhalation	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents may be exposed to COPCs in fugitive dust/volatile emissions from surface soil while living at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
	Subsurface Soil	Subsurface Soil	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs in subsurface soil during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Ingestion	Quant	Although exposures to subsurface soil by industrial workers are considered unlikely at the site, this scenario was included to aid in future risk management decisions.
						Dermal	Quant	
				Recreational Users	Child	Ingestion	Quant	Recreational users are not expected to be exposed to subsurface soil; however, this scenario is included to aid in future risk-management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents are not expected to be exposed to COPCs in subsurface soil; however, this scenario is included to aid in future risk-management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 2 OF 2

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface Soil	Air	USCG Atwater	Construction Workers	Adult	Inhalation	Quant	Construction workers may be exposed to COPCs in fuguitive dust/volatile emissions from subsurface soil during excavation activities.
				Industrial Workers	Adult	Inhalation	Quant	Although exposures to subsurface soil by industrial workers are considered unlikely at the site, this scenario was included to aid in future risk management decisions.
				Recreational Users	Child	Inhalation	Quant	*Recreational users are not expected to be exposed to subsurface soil; however, this scenario* is included to aid in future risk-management decisions.
					Adult	Inhalation	Quant	
				Residents	Child	Ingestion	Quant	Hypothetical residents are not expected to be exposed to subsurface soil; however, this scenario is included to aid in future risk-management decisions.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
	Groundwater	Groundwater	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs in groundwater during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Ingestion	None	Industrial workers are not expected to have contact with groundwater.
						Dermal	None	
				Recreational Users	Child	Ingestion	None	*Recreational users are not expected to have contact with groundwater.*
						Dermal	None	
					Adult	Ingestion	None	
						Dermal	None	
				Residents	Child	Ingestion	Quant	Hypothetical residents may be exposed to COPCs in groundwater while living at the site.
						Dermal	Quant	
					Adult	Ingestion	Quant	
						Dermal	Quant	
		Air	USCG Atwater	Construction Workers	Adult	Ingestion	Quant	Construction workers may be exposed to COPCs that have volatilized from groundwater during excavation activities.
						Dermal	Quant	
				Industrial Workers	Adult	Inhalation	None	Industrial workers are not expected to be exposed to COPCs that have volatilized from groundwater.
				Recreational Users	Child	Ingestion	None	Recreational users are not expected to be exposed to COPCs that have volatilized from groundwater.
						Dermal	None	
					Adult	Ingestion	None	
						Dermal	None	
				Residents	Adult	Inhalation	Quant	Hypothetical residents may be exposed to COPCs that have volatilized from groundwater while living at the site.
			Vapor Intrusion	Industrial Workers	Adult	Inhalation	Quant	Industrial workers may be exposed to COPCs that have volatilized from groundwater and migrated through building foundations into indoor air.
				Residents	Child	Inhalation	Quant	Hypothetical residents may be exposed to COPCs that have volatilized groundwater and migrated through building foundations into indoor air.
					Adult	Inhalation	Quant	

Notes:
COPC - Chemical of potential concern.
Quant - Quantitative.
Qual - Qualitative.

RAGS Part D Table 2

Occurrence, Distribution and Selection Of Chemicals of Potential Concern

LIST OF TABLES
RAGS PART D TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Table No.

2.1 Direct Contact with Surface Soil
2.2 Direct Contact with Subsurface Soil
2.3 Direct Contact with Groundwater
2.4 Vapor Intrusion from Groundwater to Indoor Air

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	MDEQ Background Concentration[4]	Adjusted USEPA Residential RSL[5]	MDEQ Residential Generic Cleanup Criterion[6]	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
	METALS													
	7440-38-2	Arsenic	2.5	19	MG/KG	DASS112-0002	14/14	-	19	5.8	0.39 C	7.6	Yes	ASL
	7440-39-3	Barium	26	420	MG/KG	DASS112-0002	14/14	-	420	75	1500 N	37000	No	BSL
	7440-43-9	Cadmium	0.16	2.6	MG/KG	DASS112-0002	14/14	-	2.6	1.2	7 N	550	No	BSL
	7440-47-3	Chromium	10 J	20 J	MG/KG	DASS114-0002	14/14	-	20	18	0.29 C[8]	2500 [8]	Yes	ASL
	7440-50-8	Copper	8.7	620	MG/KG	DASS112-0002	14/14	-	620	32	310 N	20000	Yes	ASL
	7439-92-1	Lead	11	970	MG/KG	DASS112-0002	14/14	-	970	21	400	400	Yes	ASL
	7439-97-6	Mercury	0.018 J	0.64	MG/KG	DASS111A-0002	14/14	-	0.64	0.13	2.3 N[9]	160	No	BSL
	7782-49-2	Selenium	0.18	0.78	MG/KG	DASS106-0002	13/14	0.1 - 0.1	0.78	0.41	39 N	2600	No	BSL
	7440-22-4	Silver	0.045 J	0.28	MG/KG	DASS112-0002	14/14	-	0.28	1	39 N	2500	No	BSL
	7440-66-6	Zinc	31	670	MG/KG	DASS112-0002	14/14	-	670	47	2300 N	170000	No	BSL
	POLYCYCLIC AROMATIC HYDROCARBONS													
	91-57-6	2-Methylnaphthalene	0.0031 J	4.3	MG/KG	DASS105-0002	8/14	0.036 - 1.9	4.3	NA	31 N	8100	No	BSL
	83-32-9	Acenaphthene	0.008 J	0.98	MG/KG	DASS105-0002	8/14	0.036 - 1.9	0.98	NA	340 N	41000	No	BSL
	208-96-8	Acenaphthylene	0.0033 J	0.73 J	MG/KG	DASS105-0002	7/14	0.037 - 1.9	0.73	NA	340 N[10]	1600	No	BSL
	120-12-7	Anthracene	0.013 J	2.1	MG/KG	DASS105-0002	12/14	1.8 - 1.9	2.1	NA	1700 N	230000	No	BSL
	56-55-3	Benzo(a)anthracene	0.057	3.7	MG/KG	DASS105-0002	14/14	-	3.7	NA	0.15 C	20	Yes	ASL
	50-32-8	Benzo(a)pyrene	0.067	2.9	MG/KG	DASS105-0002	14/14	-	2.9	NA	0.015 C	2	Yes	ASL
	--	Benzo(a)pyrene Equivalents	0.10	4.2	MG/KG	DASS105-0002	14/14	-	4.2	NA	0.015 C	2	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	0.065	3.2	MG/KG	DASS105-0002	14/14	-	3.2	NA	0.15 C	20	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	0.044	1.5	MG/KG	DASS105-0002	14/14	-	1.5	NA	170 N[11]	2500	No	BSL
	207-08-9	Benzo(k)fluoranthene	0.045 J	2.3	MG/KG	DASS105-0002	14/14	-	2.3	NA	1.5 C	200	Yes	ASL
	218-01-9	Chrysene	0.053	3.8	MG/KG	DASS105-0002	14/14	-	3.8	NA	15 C	2000	No	BSL
	53-70-3	Dibenzo(a,h)anthracene	0.021 J	0.32	MG/KG	DASS111A-0002	4/14	0.036 - 1.9	0.32	NA	0.015 C	2	Yes	ASL
	206-44-0	Fluoranthene	0.081	8.4	MG/KG	DASS105-0002	14/14	-	8.4	NA	230 N	46000	No	BSL
	86-73-7	Fluorene	0.0038 J	2.2	MG/KG	DASS105-0002	9/14	0.19 - 1.9	2.2	NA	230 N	27000	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.036	1.2	MG/KG	DASS105-0002, DASS111A-0002	12/14	1.8 - 1.9	1.2	NA	0.15 C	20	Yes	ASL
	91-20-3	Naphthalene	0.0024 J	3	MG/KG	DASS105-0002	10/14	0.036 - 1.9	3	NA	3.6 C	16000	No	BSL
	85-01-8	Phenanthrene	0.051	13	MG/KG	DASS105-0002	14/14	-	13	NA	170 N[11]	1600	No	BSL
	129-00-0	Pyrene	0.076	8.2	MG/KG	DASS105-0002	14/14	-	8.2	NA	170 N	29000	No	BSL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - No site background data are available. Background data from Michigan Department of Environmental Quality (MDEQ) are presented (January 23, 2006).
5 - Adjusted USEPA Regional Screening Level (RSL) for Residential Soil (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ or a hazard quotient of 0.1.
6 - Michigan Department of Environmental Quality (MDEQ) Residential Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.
7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
8 - Critiera for hexavalent chromium were used for total chromium.
9 - The USEPA RSL is for mercuric chloride (and other mercury salts).
10 - The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.
11 - The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:
C = Carcinogen
COPC = Chemical of potential concern
J = Estimated value
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:
For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below screening level

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Associated Samples:

DASS101-0002	DASS106A-0002	DASS111-0002-D
DASS102-0002	DASS107-0002	DASS111A-0002
DASS102A-0002	DASS108-0002	DASS112-0002
DASS102A-0002-D	DASS109-0002	DASS112A-0002
DASS103-0002	DASS109-0002-D	DASS114-0002
DASS104-0002	DASS109A-0002	DASS115-0002
DASS104A-0002	DASS110-0002	DASS115-0002-D
DASS105-0002	DASS110A-0002	DASS115A-0002
DASS106-0002	DASS111-0002	

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	MDEQ Background Concentration[4]	Adjusted USEPA Residential RSL[5]	MDEQ Residential Generic Cleanup Criterion[6]	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
	METALS													
	7440-38-2	Arsenic	3.3	17	MG/KG	DASB114-0305	14/14	-	17	5.8	0.39 C	8	Yes	ASL
	7440-39-3	Barium	36	150	MG/KG	DASB114-0305	14/14	-	150	75	1500 N	37000	No	BSL
	7440-43-9	Cadmium	0.13	2.5	MG/KG	DASB110-0305	14/14	-	2.5	1.2	7 N	550	No	BSL
	7440-47-3	Chromium	10 J	19 J	MG/KG	DASB112-0305	14/14	-	19	18	0.29 C[8]	2500 [8]	Yes	ASL
	7440-50-8	Copper	12	180	MG/KG	DASB109-0305	14/14	-	180	32	310 N	20000	No	BSL
	7439-92-1	Lead	8.5	2400	MG/KG	DASB109-0305	14/14	-	2400	21	400.	400	Yes	ASL
	7439-97-6	Mercury	0.031 J	1.3	MG/KG	DASB115A-0204	14/14	-	1.3	0.13	2.3 N[9]	160	No	BSL
	7782-49-2	Selenium	0.14	2.6	MG/KG	DASB109-0305	13/14	0.1 - 0.1	2.6	0.41	39 N	2600	No	BSL
	7440-22-4	Silver	0.064	0.22	MG/KG	DASB110-0305	14/14	-	0.22	1	39 N	2500	No	BSL
	7440-66-6	Zinc	38	260	MG/KG	DASB109-0305	14/14	-	260	47	2300 N	170000	No	BSL
	POLYCYCLIC AROMATIC HYDROCARBONS													
	91-57-6	2-Methylnaphthalene	0.0028 J	2	MG/KG	DASB102A-0406-D	11/14	0.019 - 0.21	2	NA	31 N	8100	No	BSL
	83-32-9	Acenaphthene	0.0056 J	0.51	MG/KG	DASB102A-0406-D	9/14	0.019 - 0.21	0.51	NA	340 N	41000	No	BSL
	208-96-8	Acenaphthylene	0.0074 J	0.18 J	MG/KG	DASB102A-0406-D	6/14	0.019 - 0.21	0.18	NA	340 N[10]	41000	No	BSL
	120-12-7	Anthracene	0.0044 J	1 J	MG/KG	DASB102A-0406-D	14/14	-	1	NA	1700 N	230000	No	BSL
	--	Benzo(a)pyrene Equivalents	0.028	3.3	MG/KG	DASB106A-0204	14/14	-	3.3	NA	0.15 C	20	Yes	ASL
	56-55-3	Benzo(a)anthracene	0.011 J	3	MG/KG	DASB106A-0204	14/14	-	3	NA	0.15 C	20	Yes	ASL
	50-32-8	Benzo(a)pyrene	0.0078 J	2.2	MG/KG	DASB106A-0204	14/14	-	2.2	NA	0.015 C	2	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	0.01 J	3	MG/KG	DASB106A-0204	14/14	-	3	NA	0.15 C	20	Yes	ASL
	191-24-2	Benzo(g,h,i)perylene	0.0078 J	0.83	MG/KG	DASB107-0204	14/14	-	0.83	NA	170 N[11]	29000	No	BSL
	207-08-9	Benzo(k)fluoranthene	0.0065 J	1.2	MG/KG	DASB106A-0204, DASB107-0204	14/14	-	1.2	NA	1.5 C	200	No	BSL
	218-01-9	Chrysene	0.013 J	2.8	MG/KG	DASB106A-0204, DASB107-0204	14/14	-	2.8	NA	15 C	2000	No	BSL
	53-70-3	Dibenzo(a,h)anthracene	0.037 J	0.4	MG/KG	DASB106A-0204	5/14	0.019 - 0.21	0.4	NA	0.015 C	2	Yes	ASL
	206-44-0	Fluoranthene	0.013 J	4.3	MG/KG	DASB106A-0204, DASB107-0204	14/14	-	4.3	NA	230 N	46000	No	BSL
	86-73-7	Fluorene	0.0019 J	1.3	MG/KG	DASB102A-0406-D	10/14	0.02 - 0.21	1.3	NA	230 N	27000	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.0063 J	0.92	MG/KG	DASB106A-0204	14/14	-	0.92	NA	0.15 C	20	Yes	ASL
	91-20-3	Naphthalene	0.0016 J	1.7	MG/KG	DASB102A-0406	13/14	0.02 - 0.02	1.7	NA	3.6 C	16000	No	BSL
	85-01-8	Phenanthrene	0.012 J	6.1 J	MG/KG	DASB102A-0406-D	14/14	-	6.1	NA	170 N[11]	29000	No	BSL
	129-00-0	Pyrene	0.015 J	4.4	MG/KG	DASB106A-0204	14/14	-	4.4	NA	170 N	29000	No	BSL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - No site background data are available. Background data from Michigan Department of Environmental Quality (MDEQ) are presented (January 23, 2006).
5 - Adjusted USEPA Regional Screening Level (RSL) for Residential Soil (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ or a hazard quotient of 0.1.
6 - Michigan Department of Environmental Quality (MDEQ) Residential Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.
7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
8 - Critiera for hexavalent chromium were used for total chromium.
9 - The USEPA RSL is for mercuric chloride (and other mercury salts).
10 - The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.
11 - The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

Definitions:
C = Carcinogen
COPC = Chemical of potential concern
J = Estimated value
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:
For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below screening level

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples:

DASB101-0305	DASB106-0305	DASB111-0305
DASB102-0305	DASB106A-0204	DASB111A-0305
DASB102A-0406	DASB107-0204	DASB112-0305
DASB102A-0406-D	DASB108-0305	DASB112A-0204
DASB103-0305	DASB109-0305	DASB114-0305
DASB104-0305	DASB109A-0204	DASB115-0305
DASB104A-0204	DASB110-0305	DASB115A-0204
DASB105-0305	DASB110A-0305	

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Scenario Timeframe:
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	Range of Background Concentrations[4]	Adjusted USEPA Tap Water RSL[5]	MDEQ Residential Drinking Water Criterion[6]	USEPA MCL[7]	COPC Flag	Rationale for Contaminant Deletion or Selection[8]
	METALS														
	7440-38-2	Arsenic	1.5 J	6.2	ug/L	DA-GW-02-062011	4/4	-	6.2	NA	0.045 C	10	10	Yes	ASL
	7440-39-3	Barium	150	290	ug/L	DA-GW-03-062011, DA-GW-03-062011-D	4/4	-	290	NA	730 N	2000	2000	No	BSL
	7440-47-3	Chromium	0.27 J	0.36 J	ug/L	DA-GW-04-062011	4/4	-	0.36	NA	0.043 C[9]	100 [9]	100 [9]	Yes	ASL
	7440-50-8	Copper	0.74 J	2.6	ug/L	DA-GW-04-062011	4/4	1 - 1	2.6	NA	150 N	1000	1300	No	BSL
	7439-92-1	Lead	0.33 J	2.1	ug/L	DA-GW-04-062011	4/4	-	2.1	NA	NA	4	15	No	BSL
	7782-49-2	Selenium	1 J	1 J	ug/L	DA-GW-02-062011	1/4	5 - 5	1	NA	18 N	50	50	No	BSL
	7440-66-6	Zinc	3.9 J	110 J	ug/L	DA-GW-04-062011	4/4	-	110	NA	1100 N	2400	NA	No	BSL
	DISSOLVED METALS														
	7440-38-2	Arsenic	0.95 J	3 J	ug/L	DA-GW-04-062011	4/4	-	3	NA	0.045 C	10	10	Yes	ASL
	7440-39-3	Barium	150 J	310 J	ug/L	DA-GW-03-062011	4/4	-	310	NA	730 N	2000	2000	No	BSL
	7440-47-3	Chromium	0.21 J	0.47 J	ug/L	DA-GW-02-062011	3/4	1 - 1	0.47	NA	0.043 C[9]	100 [9]	100	Yes	ASL
	7440-50-8	Copper	0.42 J	0.88 J	ug/L	DA-GW-04-062011	3/4	1 - 1	0.88	NA	150 N	1000	1300	No	BSL
	7439-92-1	Lead	0.17 J	0.44 J	ug/L	DA-GW-04-062011	3/4	1 - 1	0.44	NA	NA	4	15	No	BSL
	7440-66-6	Zinc	3.9 J	110	ug/L	DA-GW-04-062011	3/4	5 - 5	110	NA	1100 N	2400	NA	No	BSL
	POLYCYCLIC AROMATIC HYDROCARBONS														
	91-57-6	2-Methylnaphthalene	0.07 J	24 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	24	NA	15 N	260	NA	Yes	ASL
	83-32-9	Acenaphthene	0.05 J	6 J	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	6	NA	220 N	1300	NA	No	BSL
	208-96-8	Acenaphthylene	0.05 J	1.7 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	1.7	NA	220 N[10]	52	NA	No	BSL
	120-12-7	Anthracene	0.19 J	3.8 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	3.8	NA	1100 N	43	NA	No	BSL
	56-55-3	Benzo(a)anthracene	0.28 J	0.28 J	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.28	NA	0.029 C	2.1	NA	Yes	ASL
	--	Benzo(a)pyrene Equivalents	0.029	0.029	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.029	NA	0.0029 C	5	0.2	Yes	ASL
	207-08-9	Benzo(k)fluoranthene	0.05 J	0.05 J	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.05	NA	0.29 C	0.8	NA	No	BSL
	218-01-9	Chrysene	0.1 J	0.1 J	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.1	NA	2.9 C	1.6	NA	No	BSL
	206-44-0	Fluoranthene	0.15 J	0.52 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	0.52	NA	150 N	210	NA	No	BSL
	86-73-7	Fluorene	0.27 J	3.5 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	3.5	NA	150 N	880	NA	No	BSL
	91-20-3	Naphthalene	0.05 J	120	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	120	NA	0.14 C	520	NA	Yes	ASL
	85-01-8	Phenanthrene	0.05 J	8.8 J	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	8.8	NA	110 N[11]	52	NA	No	BSL
	129-00-0	Pyrene	0.04 J	0.39 J	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	0.39	NA	110 N	140	NA	No	BSL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - No background data are available for groundwater.
5 - Adjusted USEPA Regional Screening Level (RSL) for Tap Water (June 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-6}$ or a hazard quotient of 0.1.
6 - Michigan Department of Environmental Quality (MDEQ) Residential Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of $1x10^{-5}$ or a hazard quotient of 1.
7 - 2011 Edition of the Drinking Water Standards and Health Advisories (USEPA, January 2011).
8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
9 - Critiera for hexavalent chromium were used for total chromium.
10 - The USEPA RSL for acenaphthene was used as a surrogate for acenaphthylene.
11 - The USEPA RSL for pyrene was used as a surrogate for phenanthrene.

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:
C = Carcinogen
COPC = Chemical of potential concern
J = Estimated value
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:

For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below COPC Screening Level

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Associated Samples:
DA-GW-01-062011
DA-GW-02-062011
DA-GW-03-062011
DA-GW-03-062011-D
DA-GW-04-062011

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - VAPOR INTRUSION FROM GROUNDWATER TO INDOOR AIR
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Scenario Timeframe:
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	Range of Background Concentrations[4]	Is Chemical Sufficiently Volatile and Toxic?[5]	Adjusted Groundwater Volatilization Criterion[6]	MDEQ Residential Volatilization to Indoor Air Criterion[7]	COPC Flag	Rationale for Contaminant Deletion or Selection[8]
	METALS														
	7440-38-2	Arsenic	1.5 J	6.2	ug/L	DA-GW-02-062011	4/4	-	6.2	NA	No	NA	NA	No	NTX
	7440-39-3	Barium	150	290	ug/L	DA-GW-03-062011, DA-GW-03-062011-D	4/4	-	290	NA	No	NA	NA	No	NTX
	7440-47-3	Chromium	0.27 J	0.36 J	ug/L	DA-GW-04-062011	4/4	-	0.36	NA	No	NA	NA	No	NTX
	7440-50-8	Copper	0.74 J	2.6	ug/L	DA-GW-04-062011	4/4	1 - 1	2.6	NA	No	NA	NA	No	NTX
	7439-92-1	Lead	0.33 J	2.1	ug/L	DA-GW-04-062011	4/4	-	2.1	NA	No	NA	NA	No	NTX
	7782-49-2	Selenium	1 J	1 J	ug/L	DA-GW-02-062011	1/4	5 - 5	1	NA	No	NA	NA	No	NTX
	7440-66-6	Zinc	3.9 J	110 J	ug/L	DA-GW-04-062011	4/4	-	110	NA	No	NA	NA	No	NTX
	DISSOLVED METALS														
	7440-38-2	Arsenic	0.95 J	3 J	ug/L	DA-GW-04-062011	4/4	-	3	NA	No	NA	NA	No	NTX
	7440-39-3	Barium	150 J	310 J	ug/L	DA-GW-03-062011	4/4	-	310	NA	No	NA	NA	No	NTX
	7440-47-3	Chromium	0.21 J	0.47 J	ug/L	DA-GW-02-062011	3/4	1 - 1	0.47	NA	No	NA	NA	No	NTX
	7440-50-8	Copper	0.42 J	0.88 J	ug/L	DA-GW-04-062011	3/4	1 - 1	0.88	NA	No	NA	NA	No	NTX
	7439-92-1	Lead	0.17 J	0.44 J	ug/L	DA-GW-04-062011	3/4	1 - 1	0.44	NA	No	NA	NA	No	NTX
	7440-66-6	Zinc	3.9 J	110	ug/L	DA-GW-04-062011	3/4	5 - 5	110	NA	No	NA	NA	No	NTX
	POLYCYCLIC AROMATIC HYDROCARBONS														
	91-57-6	2-Methylnaphthalene	0.07 J	24 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	24	NA	No	NA	NA	No	NTX
	83-32-9	Acenaphthene	0.05 J	6 J	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	6	NA	No	NA	4200	No	BSL
	208-96-8	Acenaphthylene	0.05 J	1.7 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	1.7	NA	No	NA	3900	No	BSL
	120-12-7	Anthracene	0.19 J	3.8 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	3.8	NA	No	NA	43	No	BSL
	56-55-3	Benzo(a)anthracene	0.28 J	0.28 J	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.28	NA	No	NA	NA	No	NTX
	--	Benzo(a)pyrene Equivalents	0.029	0.029	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.029	NA	No	NA	NA	No	NTX
	207-08-9	Benzo(k)fluoranthene	0.05 J	0.05 J	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.05	NA	No	NA	NA	No	NTX
	218-01-9	Chrysene	0.1 J	0.1 J	ug/L	DA-GW-02-062011	1/4	0.5 - 0.5	0.1	NA	No	NA	NA	No	NTX
	206-44-0	Fluoranthene	0.15 J	0.52 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	0.52	NA	No	NA	210	No	BSL
	86-73-7	Fluorene	0.27 J	3.5 J	ug/L	DA-GW-02-062011	2/4	0.5 - 0.5	3.5	NA	No	NA	2000	No	BSL
	91-20-3	Naphthalene	0.05 J	120	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	120	NA	Yes	4 C	31000	Yes	ASL
	85-01-8	Phenanthrene	0.05 J	8.8 J	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	8.8	NA	No	NA	1000	No	NTX
	129-00-0	Pyrene	0.04 J	0.39 J	ug/L	DA-GW-02-062011	3/4	0.5 - 0.5	0.39	NA	No	NA	140	No	NTX

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - No background data are available for groundwater.
5 - Appendix A of DoD Vapor Intrusion Handbook, January 2009.
6 - Calculated using methodology presented in Appendix D of USEPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, November 2002. EPA530-F-02-052.
Adjusted values correspond to a target cancer risk level of 1E-6 or HQ = 0.1 and an attenuation factor of 0.001.
7 - Michigan Department of Environmental Quality (MDEQ) Residential Volatilization to Indoor Air Generic Cleanup Criteria (March 25, 2011). Values are based on an incremental lifetime cancer risk of 1x10-5 or a hazard quotient of 1.
8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples:
DA-GW-01-062011
DA-GW-02-062011
DA-GW-03-062011
DA-GW-03-062011-D
DA-GW-04-062011

Definitions:
C = Carcinogen
COPC = Chemical of potential concern
J = Estimated value
N = Noncarcinogen
NA = Not applicable/not available

Rationale Codes:
For selection as a COPC:
ASL = Above screening level

For elimination as a COPC:
BSL = Below COPC Screening Level
NTX = No toxicity criterion

RAGS Part D Table 3

Medium-Specific Exposure Point Concentration Summary

LIST OF TABLES
RAGS PART D TABLE 3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

Table No.

Reasonable Maximum/Central Tendency Exposures

3.1.RME Surface Soil
3.2.RME Subsurface Soil
3.3.RME Groundwater

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil	Benzo(a)pyrene Equivalents	mg/kg	1.1	2.0 (G)	4.2	2	mg/kg	95% Approximate Gamma UCL	ProUCL 4.1.00
	Arsenic	mg/kg	8.1	10.0 (G)	19	10.0	mg/kg	95% Approximate Gamma UCL	ProUCL 4.1.00
	Chromium VI	mg/kg	14.5	15.8 (N)	20 J	15.8	mg/kg	95% Student's-t UCL	ProUCL 4.1.00
	Copper	mg/kg	116	213 (G)	620	213	mg/kg	95% Approximate Gamma UCL	ProUCL 4.1.00
	Lead	mg/kg	267	472 (G)	970	267	mg/kg	Mean Concentration	(1)

G = Gamma
J = Estimated
N = Normal

1 - The mean concentration is used as the exposure point concentration for evaluating exposures to lead.
USEPA, 1994: Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for lead in Children.

TABLE 3.2.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Subsurface Soil	Benzo(a)pyrene Equivalents	mg/kg	0.78	1.6 (G)	3.3	1.6	mg/kg	95% Approximate Gamma UCL	ProUCL 4.1.00
	Arsenic	mg/kg	8.2	10.4 (G)	17	10.4	mg/kg	95% Approximate Gamma UCL	ProUCL 4.1.00
	Chromium VI	mg/kg	14.8	15.9 (N)	19 J	15.9	mg/kg	95% Student's-t UCL	ProUCL 4.1.00
	Lead	mg/kg	300	1980 (L)	2400	300	mg/kg	Mean Concentration	(1)

G = Gamma
J = Estimated
L = Lognormal
N = Normal

1 - The mean concentration is used as the exposure point concentration for evaluating exposures to lead.
USEPA, 1994: Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for lead in Children.

TABLE 3.3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Atwater	2-Methylnaphthalene	ug/L	NA	NA	24 J	24	ug/L	Maximum Detected Concentration	(1)
	Benzo(a)pyrene Equivalents	ug/L	NA	NA	0.029	0.029	ug/L	Maximum Detected Concentration	(1)
	Naphthalene	ug/L	NA	NA	120	120	ug/L	Maximum Detected Concentration	(1)
	Arsenic	ug/L	NA	NA	6.2	6.2	ug/L	Maximum Detected Concentration	(1)
	Chromium VI	ug/L	NA	NA	0.36 J	0.36	ug/L	Maximum Detected Concentration	(1)

J = estimated

1 - The maximum detected concentration is used as the exposure point concentration because and statistics were not calculated because only four samples are available.

RAGS Part D Table 4

Values Used For Daily Intake Calculations

LIST OF TABLES
RAGS PART D TABLE 4
VALUES USED FOR DAILY INTAKE CALCULATIONS

Table No.

Reasonable Maximum Exposures

4.1.RME	Construction Workers Exposed to Surface/Subsurface Soil
4.2.RME	Construction Workers Exposed to Surface/Subsurface Soil - Soils to Air
4.3.RME	Construction Workers Exposed to Groundwater
4.4.RME	Construction Workers Exposed to Groundwater - Groundwater to Air
4.5.RME	Industrial Workers Exposed to Surface/Subsurface Soil - Soils to Air
4.6.RME	Industrial Workers Exposed to Surface/Subsurface Soil - Soils to Air
4.7.RME	Child Recreational Users Exposed to Surface/Subsurface Soil
4.8.RME	Child Recreational Users Exposed to Surface/Subsurface Soil - Soils to Air
4.9.RME	Adult Recreational Users Exposed to Surface/Subsurface Soil
4.10.RME	Adult Recreational Users Exposed to Surface/Subsurface Soil - Soils to Air
4.11.RME	Child Residents Exposed to Surface/Subsurface Soil
4.12.RME	Child Residents Exposed to Surface/Subsurface Soil - Soils to Air
4.13.RME	Child Residents Exposed to Groundwater
4.14.RME	Child Residents Exposed to Volatile Emissions from Groundwater While Showering
4.15.RME	Adult Residents Exposed to Surface/Subsurface Soil
4.16.RME	Adult Residents Exposed to Surface/Subsurface Soil - Soils to Air
4.17.RME	Adult Residents Exposed to Groundwater
4.18.RME	Adult Residents Exposed to Volatile Emissions from Groundwater While Showering

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS- SOILS

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	330	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	BW x AT
				EF	Exposure Frequency	250	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgment.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 4.61E-08 Cancer Dermal Intake = 1.38E-07

Noncancer Ingestion Intake = 3.23E-06 Noncancer Dermal Intake = 9.69E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - SOILS TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	8	hours/day	(1)	$\frac{CA \times ET \times EF \times ED}{AT \times 24\ hours/day}$
				EF	Exposure Frequency	250	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				PEF	Particulate Emission Factor	1.43E+06	m3/kg	USEPA, 2002a	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	

Notes:

1 - Professional judgment.

Sources:

USEPA, 1989: *Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.*

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Cancer Inhalation Intake = 3.26E-03 Noncancer Inhalation Intake = 2.28E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - GROUNDWATER

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	Atwater	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	ug/L	USEPA, 1992	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	USEPA, 1991	
				IR-GW	Ingestion Rate of Groundwater	0.01	L/day	(1)	$\frac{CGW \times CF \times IR\text{-}GW \times EF \times ED}{BW \times AT}$
				EF	Exposure Frequency	90	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	Atwater	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	$\frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
				CF	Conversion factor	0.001	L/cm^3	- -	
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t^*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	4	hr/event	(1)	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t^*
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	(1)	
				EF	Exposure Frequency	90	days/year	(1)	For organics if tevent > t^*
				ED	Exposure Duration	1	years	(1)	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				BW	Body Weight	70	kg	USEPA, 1989	2 x τ +(1 + 3B + $3B^2$)/(1+B^2)
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Dermal Intake = 1.66E-01 Noncancer Dermal Intake = 1.16E+01

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CONSTRUCTION WORKERS - GROUNDWATER TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	VDEQ, 2004	Exposure Concentration (mg/m^3) =
				CW	Chemical concentration in water.	Average	ug/L	--	
				CF	Conversion Factor	0.001	mg/ug	--	$\frac{CA \times ET \times EF \times ED}{AT \times 24\ hours/day}$
				ET	Exposure Time	4	hours/day	(1)	
				EF	Exposure Frequency	90	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	CA = CW x CF x VF
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				VF	Volatilization Factor	Calculated	(mg/m3)/(mg/L)	VDEQ, 2004	

Notes:

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

VDEQ, 2004: Virginia Department of Environmental Quality (VDEQ, online- http://www.deq.state.va.us/vrprisk/homepage.html).

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Cancer Inhalation Intake = 5.87E-07 Noncancer Inhalation Intake = 4.11E-05

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - INDUSTRIAL WORKERS - SOIL

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Workers	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	BW x AT
				EF	Exposure Frequency	250	days/year	USEPA, 2002b	
				ED	Exposure Duration	25	years	USEPA, 2002b	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
Dermal	Industrial Workers	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	USEPA, 2002b	
				ED	Exposure Duration	25	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 3.49E-07 Cancer Dermal Intake = 2.31E-06

Noncancer Ingestion Intake = 9.78E-07 Noncancer Dermal Intake = 6.46E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.6.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - INDUSTRIAL WORKERS - SOIL TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Industrial Workers	Adult	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	*Exposure Time*	8	*hours/day*	(1)	$\frac{CA \times ET \times EF \times ED}{AT \times 24\ hours/day}$
				EF	Exposure Frequency	250	days/year	USEPA, 2002a	
				ED	Exposure Duration	25	years	USEPA, 2002a	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	CA = (1/PEF + 1/VF) x Cs
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.50E+08	m3/kg	USEPA 2004	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	
				Q/C	Inverse of mean concentration at center of source	73.95045	g/m2-s per kg/m3	USEPA 2008	
				Ut	Equivalent threshold of wind velocity at 7m.	11.32	m/sec	USEPA 2008	
				Um	Mean annual wind speed	3.84	m/sec	USEPA 2008	
				V	Fraction of vegetative cover	0.5	unitless	USEPA 2008	
				F(x)	Function dependent of Um/Ut	0.0345	unitless	USEPA 2008	

Notes:

1 - Length of typical work day.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2008: Soil Screening Guidance calculation Internet site at http://risk.lsd.ornl.gov/calc_start.htm. Site-specific values for Cleveland, OH.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Cancer Inhalation Intake = 8.15E-02 Noncancer Inhalation Intake = 2.28E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - CHILD RECREATIONAL USERS - SOILS
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Child	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	200	mg/day	(1), USEPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(1)	BW x AT
				EF	Exposure Frequency	160	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2190	days	USEPA, 1989	
Dermal	Recreational User	Child	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	(1), USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	(1), USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	160	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2190	days	USEPA, 1989	

Notes:

1 - Assumed same as resident.

2 - Assumed onsite 5 days per week during the warm weather months (8 months per year).

3 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, children recreational users will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund, Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002 Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites OSWER 9285 6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 5.01E-07 Cancer Dermal Intake (Age 0 - 6) = 1.40E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 1.67E-07 Cancer Dermal Intake (Age 0 - 2) = 4.68E-07

Cancer Ingestion Intake (Age 2 - 6) = 3.34E-07 Cancer Dermal Intake (Age 2 - 6) = 9.35E-07

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 5.84E-06 Noncancer Dermal Intake = 1.64E-05

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CHILD RECREATIONAL USERS - SOILS TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User	Child	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	4	hours/day	(1)	CA x ET x EF x ED / AT x 24 hours/day
				EF	Exposure Frequency	160	days/year	(2)	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(3), USEPA, 1989, 2005	CA = (1/PEF + 1/VF) x Cs
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.50E+08	m3/kg	USEPA 2004	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	
				Q/C	Inverse of mean concentration at center of source	73.95045	g/m2-s per kg/m3	USEPA 2008	
				Ut	Equivalent threshold of wind velocity at 7m.	11.32	m/sec	USEPA 2008	
				Um	Mean annual wind speed	3.84	m/sec	USEPA 2008	
				V	Fraction of vegetative cover	0.5	unitless	USEPA 2008	
				F(x)	Function dependent of Um/Ut	0.0345	unitless	USEPA 2008	

Notes:

1 - Professional judgment.

2 - Assumed onsite 5 days per week during the warm weather months (8 months per year).

3 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, children recreational users will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2008: Soil Screening Guidance calculation Internet site at http://risk.lsd.ornl.gov/calc_start.htm. Site-specific values for Cleveland, OH.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Non-Mutagenic Chemicals

Cancer Inhalation Intake (Age 0 - 6) = 6.26E-03 Noncancer Inhalation Intake = 7.31E-02

Mutagenic Chemicals

Cancer Inhalation Intake (Age 0 - 2) = 2.09E-03

Cancer Inhalation Intake (Age 2 - 6) = 4.17E-03

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.9.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - SOILS
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	(1)	BW x AT
				EF	Exposure Frequency	160	days/year	(2)	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Recreational User	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	160	days/year	(2)	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(3), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(3), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Assumed same as resident.

2 - Assumed onsite 5 days per week during the warm weather months (8 months per year).

3 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, adult recreational users will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund, Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 2.15E-07 Cancer Dermal Intake (Age 6 - 30) = 8.57E-07

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 8.95E-08 Cancer Dermal Intake (Age 6 - 16) = 3.57E-07

Cancer Ingestion Intake Age 16 - 30) = 1.25E-07 Cancer Dermal Intake (Age 16 - 30) = 5.00E-07

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 6.26E-07 Noncancer Dermal Intake = 2.50E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from Ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.10.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RECREATIONAL USERS - SOILS TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User	Adult	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	4	hours/day	(1)	$\frac{CA \times ET \times EF \times ED}{AT \times 24 \text{ hours/day}}$
				EF	Exposure Frequency	100	days/year	(1)	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(2), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(2), USEPA, 1989, 2005	CA = (1/PEF + 1/VF) x Cs
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8760	days	USEPA, 1989	
				PEF	Particulate Emission Factor	*9.50E+08*	m3/kg	*USEPA 2004*	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	
				Q/C	Inverse of mean concentration at center of source	73.95045	g/m2-s per kg/m3	USEPA 2008	
				Ut	Equivalent threshold of wind velocity at 7m.	11.32	m/sec	USEPA 2008	
				Um	Mean annual wind speed	3.84	m/sec	USEPA 2008	
				V	Fraction of vegetative cover	0.5	unitless	USEPA 2008	
				F(x)	Function dependent of Um/Ut	0.0345	unitless	USEPA 2008	

Notes:

1 - Professional judgment. Assume four days a week in warm weather months for RME and two days a week for CTE.

2 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, adult recreational users will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2008: Soil Screening Guidance calculation Internet site at http://risk.lsd.ornl.gov/calc_start.htm. Site-specific values for Cleveland, OH.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Non-Mutagenic Chemicals

Cancer Inhalation Intake (Age 6 - 30) = 1.57E-02

Noncarcinogenic Chemicals

Noncancer Inhalation Intake = 4.57E-02

Mutagenic Chemicals

Cancer Inhalation Intake (Age 6 - 16) = 6.52E-03

Cancer Inhalation Intake (Age 16 - 30) = 9.13E-03

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.11.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - SOILS
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Child	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	200	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1991	BW x AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Resident	Child	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA 1989	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A EPA/540/1-88/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002a:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285 6-10, December

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 1.10E-06 Cancer Dermal Intake (Age 0 - 6) = 3.07E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 3.65E-07 Cancer Dermal Intake (Age 0 - 2) = 1.02E-06

Cancer Ingestion Intake (Age 2 - 6) = 7.31E-07 Cancer Dermal Intake (Age 2 - 6) = 2.05E-06

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.28E-05 Noncancer Dermal Intake = 3.58E-05

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.12.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS SOILS TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Resident	Child	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	24	hours/day	USEPA, 1991	$\frac{CA \times ET \times EF \times ED}{AT \times 24 \text{ hours/day}}$
				EF	Exposure Frequency	350	days/year	USEPA, 1994	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	CA = (1/PEF + 1/VF) x Cs
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2190	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.50E+08	m3/kg	USEPA 2004	
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	
				Q/C	Inverse of mean concentration at center of source	73.95045	g/m2-s per kg/m3	USEPA 2008	
				Ut	Equivalent threshold of wind velocity at 7m.	11.32	m/sec	USEPA 2008	
				Um	Mean annual wind speed	3.84	m/sec	USEPA 2008	
				V	Fraction of vegetative cover	0.5	unitless	USEPA 2008	
				F(x)	Function dependent of Um/Ut	0.0345	unitless	USEPA 2008	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2008: Soil Screening Guidance calculation Internet site at http://risk.lsd.ornl.gov/calc_start.htm. Site-specific values for Cleveland, OH.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Non-Mutagenic Chemicals

Cancer Inhalation Intake (Age 0 - 6) = 8.22E-02

Noncarcinogenic Chemicals

Noncancer Inhalation Intake = 1.92E+00

Mutagenic Chemicals

Cancer Inhalation Intake (Age 0 - 2) = 2.74E-02

Cancer Inhalation Intake (Age 2 - 6) = 5.48E-02

Cancer risk from Ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from Ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.13 RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - CHILD RESIDENTS - GROUNDWATER
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Child	Atwater	CGW	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1	L/day	USEPA, 1994	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	350	days/year	USEPA, 1994	BW x AT
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	15	kg	USEPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Residents	Child	Atwater	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	DAevent x EV x EF x ED x SA
				CF	Conversion factor	0.001	L/cm^3	--	BW x AT
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	For inorganics
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				tevent	Duration of event	1	hr/event	USEPA, 2004	
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	For organics if tevent <= t*
				SA	Skin Surface Available for Contact	6,600	cm2	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt[(6 x τ x tevent)/pi]
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1994	
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x [tevent/(1+B) +
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	2 x τ x(1 + 3B + 3B^2)/(1+B^2)
				BW	Body Weight	15	kg	USEPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	

Notes:

1 - Children will be evaluated as one age group (0 - 6 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential children will be evaluated as two age groups, 0 - 2 years and 2 - 6 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 6) = 5.48E-06 Cancer Dermal Intake Time (Age 0 - 6) = 3.62E+01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 0 - 2) = 1.83E-06 Cancer Dermal Intake (Age 0 - 2) = 1.21E+01

Cancer Ingestion Intake (Age 2 - 6) = 3.65E-06 Cancer Dermal Intake (Age 2 - 6) = 2.41E+01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 6.39E-05 Noncancer Dermal Intake = 4.22E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.14.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residents	Adult	Atwater	S	Volatile Chemical Generation Rate	Derived	mg/m3-min-shower	Foster&Chrostowski 1987	Exposure Concentration (mg/m^3)=
				K	Masss Transfer Coefficient	Derived	min	Foster&Chrostowski 1987	
				EF	Exposure Frequency	350	showers/year	U.S. EPA, 1991	$\frac{S \times K \times EF \times ED}{AT \times Ra \times CF}$
				ED1	Exposure Duration (Age 0 - 2)	2	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 2 - 6)	4	years	(1), USEPA, 1989, 2005	
				Ra	Air Exchange Rate	0.017	min^{-1}	Foster&Chrostowski 1987	
				CF	Conversion Factor	1440	min/day	--	
				Ds	Shower Duration	30	min	U.S. EPA, 2004	
				Dt	Total Time in Bathroom	60	min	Professional judgement	
				Fr	Shower Water Flow Rate	10	L/min	Foster&Chrostowski 1987	
				Sv	Shower Room Air Volume	12	m^3	Foster&Chrostowski 1987	
				ts	Shower Dropler Drop Time	0.5	sec	Foster&Chrostowski 1987	
				d	Shower Droplet Diameter	1	mm	Foster&Chrostowski 1987	
				T1	Calibration Water Temperature	293	K	Foster&Chrostowski 1987	
				Ts	Shower Water Temperature	318	K	Foster&Chrostowski 1987	
				m1	Water Viscosity at T1	1.002	cp	Foster&Chrostowski 1987	
				ms	Water Viscosity at Ts	0.596	cp	Foster&Chrostowski 1987	
				AT-C	Averaging Time (Cancer)	25550	days	U.S. EPA, 1989	
				AT-N	Averaging Time (Noncancer)	2190	days	U.S. EPA ,1989	

Notes:

1 - Adults were evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults were evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources

U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

U.S. EPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Foster, S.A. and P.C. Chrostowski, 1987. Inhalation Exposure to Volatile Organic Contaminants in the Shower.

Unit Intake Calculations

Inhalation Intake = (EF x ED x ET)/(AT x Ra x CF)

Non-Mutagenic Chemicals		Noncarcinogenic Chemicals	
Cancer Inhalation Intake (Age 6 - 30) =	3.42E-03	Noncancer Inhalation Intake =	4.00E-02
Mutagenic Chemicals			
Cancer Inhalation Intake (Age 0 - 2) =	1.14E-03		
Cancer Inhalation Intake n (Age 2 - 6) =	2.28E-03		

TABLE 4.15.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - SOILS
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) =
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	CS x IRS x CF3 x FI x EF x ED
				FI	Fraction Ingested	1	unitless	USEPA, 1991	BW x AT
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Resident	Adult	Atwater	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) =
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	CS x CF3 x SA x SSAF x DABS x EV x EF x ED
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	BW x AT
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EV	Events Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 2002b	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989. Risk Assessment Guidance for Superfund Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002:Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 4.70E-07 Cancer Dermal Intake (Age 6 - 30) = 1.87E-06

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 1.96E-07 Cancer Dermal Intake (Age 6 - 16) = 7.81E-07

Cancer Ingestion Intake (Age 16 - 30) = 2.74E-07 Cancer Dermal Intake (Age 16 - 30) = 1.09E-06

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 1.37E-06 Noncancer Dermal Intake = 5.47E-06

Cancer risk from ingestion = Soil concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Soil concentration x Cancer Dermal Intake x Absorption Factor x Dermal Cancer Slope Factor

Hazard Index from ingestion = Soil concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Soil concentration x Noncancer Dermal Intake x Absorption Factor / Dermal Reference Dose

TABLE 4.16.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - SOILS TO AIR

USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Resident	Adult	Atwater	CA	Chemical concentration in air	Calculated	mg/m3	USEPA, 2002a	Exposure Concentration (mg/m^3) =
				CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002b	
				ET	Exposure Time	24	hours/day	USEPA, 1991	$\frac{CA \times ET \times EF \times ED}{AT \times 24\ hours/day}$
				EF	Exposure Frequency	350	days/year	USEPA, 2002a	
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	$CA = (1/PEF + 1/VF) \times Cs$
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8760	days	USEPA, 1989	
				PEF	Particulate Emission Factor	9.50E+08	m3/kg	USEPA 2004	$PEF = \frac{Q / C \times 3600}{0.036 \times (1 - V) \times (U_m / U_t)^3 \times F(x)}$
				VF	Volatilization Factor	Chemical-specific	m3/kg	USEPA, 2002a	
				Q/C	Inverse of mean concentration at	73.95045	g/m2-s per	USEPA 2008	
					center of source		kg/m3		$F(x) = 0.18 * (8x^3 + 12x) * \exp(-x^2)$
				Ut	Equivalent threshold of wind velocity at 7m.	11.32	m/sec	USEPA 2008	
				Um	Mean annual wind speed	3.84	m/sec	USEPA 2008	$x = 0.886 * Ut / Um$
				V	Fraction of vegetative cover	0.5	unitless	USEPA 2008	
				F(x)	Function dependent of Um/Ut	0.0345	unitless	USEPA 2008	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002a: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2002b: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2008: Soil Screening Guidance calculation Internet site at http://risk.lsd.ornl.gov/calc_start.htm. Site-specific values for Cleveland, OH.

Unit Intake Calculations

Unit Exposure Concentration = (ET x EF x ED)/(AT x 24 hours/day)

Non-Mutagenic Chemicals

Cancer Inhalation Intake (Age 6 - 30) = 3.29E-01

Noncarcinogenic Chemicals

Noncancer Inhalation Intake = 9.59E-01

Mutagenic Chemicals

Cancer Inhalation Intake (Age 6 - 16) = 1.37E-01

Cancer Inhalation Intake (Age 16 - 30) = 1.92E-01

Cancer risk from ingestion = Air concentration x Cancer Inhalation Intake x Inhalation Cancer Slope Factor

Hazard Index from ingestion = Air concentration x Noncancer Inhalation Intake / Inhalation Reference Dose

TABLE 4.17 RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE - ADULT RESIDENTS - GROUNDWATER
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	Atwater	CGW	Chemical Concentration in Groundwater	95% UCL or Max	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) =
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	2	L/day	USEPA, 1994	CGW x CF x IR-GW x EF x ED
				EF	Exposure Frequency	350	days/year	USEPA, 1994	BW x AT
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Residents	Adult	Atwater	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) =
				Cw	Chemical Concentration in Groundwater	Max or 95% UCL	mg/kg	USEPA, 2002a	DAevent x EV x EF x ED x SA
				FA	Fraction Absorbed	Chemical Specific	unitless	USEPA, 2004	BW x AT
				CF	Conversion factor	0.001	L/cm^3	--	
				Kp	Permeability coefficient	Chemical Specific	cm/hr	USEPA, 2004	For inorganics
				τ	Lag time	Chemical Specific	hr/event	USEPA, 2004	DAevent = Kp x CW x CF x tevent
				t*	Time it takes to reach steady state	Chemical Specific	hr/event	USEPA, 2004	
				tevent	Duration of event	0.58	hr/event	USEPA, 2004	For organics if tevent <= t*
				B	Bunge model constant	Chemical Specific	unitless	USEPA, 2004	DAevent= 2 x FA x Kp x Cw x CF x sqrt{(6 x τ x tevent)/pi}
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1994	For organics if tevent > t*
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	DAevent =FA x Kp x Cw x CF x {tevent/(1+B) +
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	2 x τ +(1 + 3B + 3B^2)/(1+B^2)}
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Adults will be evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults will be evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund, Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 1997: Exposure Factors Handbook. USEPA/600/8-95/002FA.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285 6-10

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Non-Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 30) = 9.39E-06 Cancer Dermal Intake (Age 6 - 30) = 8.45E+01

Mutagenic Chemicals

Cancer Ingestion Intake (Age 6 - 16) = 3.91E-06 Cancer Dermal Intake (Age 6 - 16) = 3.52E+01

Cancer Ingestion Intake (Age 16 - 30) = 5.48E-06 Cancer Dermal Intake (Age 16 - 30) = 4.93E+01

Noncarcinogenic Chemicals

Noncancer Ingestion Intake = 2.74E-05 Noncancer Dermal Intake = 2.47E+02

Cancer risk from ingestion = Groundwater concentration x Cancer Ingestion Intake x Oral Cancer Slope Factor

Cancer risk from dermal contact = Groundwater concentration x Cancer Dermal Intake x DAevent x Dermal Cancer Slope Factor

Hazard Index from ingestion = Groundwater concentration x Noncancer Ingestion Intake / Oral Reference Dose

Hazard Index from dermal contact = Groundwater concentration x Noncancer Dermal Intake x DAevent / Dermal Reference Dose

TABLE 4.18.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
USCG ATWATER FACILITY, DETROIT, MICHIGAN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residents	Adult	Atwater	S	Volatile Chemical Generation Rate	Derived	mg/m3-min-shower	Foster&Chrostowski 1987	Exposure Concentration (mg/m^3)=
				K	Masss Transfer Coefficient	Derived	min	Foster&Chrostowski 1987	
				EF	Exposure Frequency	350	showers/year	U.S. EPA, 1991	$\frac{S \times K \times EF \times ED}{AT \times Ra \times CF}$
				ED1	Exposure Duration (Age 6 - 16)	10	years	(1), USEPA, 1989, 2005	
				ED2	Exposure Duration (Age 16 - 30)	14	years	(1), USEPA, 1989, 2005	
				Ra	*Air Exchange Rate*	0.017	min^{-1}	Foster&Chrostowski 1987	
				CF	Conversion Factor	1440	min/day	--	
				Ds	Shower Duration	30	min	U.S. EPA, 2004	
				Dt	Total Time in Bathroom	60	min	Professional judgement	
				Fr	Shower Water Flow Rate	10	L/min	Foster&Chrostowski 1987	
				Sv	Shower Room Air Volume	12	m^3	Foster&Chrostowski 1987	
				ts	Shower Dropler Drop Time	0.5	sec	Foster&Chrostowski 1987	
				d	Shower Droplet Diameter	1	mm	Foster&Chrostowski 1987	
				T1	Calibration Water Temperature	293	K	Foster&Chrostowski 1987	
				Ts	Shower Water Temperature	318	K	Foster&Chrostowski 1987	
				m1	Water Viscosity at T1	1.002	cp	Foster&Chrostowski 1987	
				ms	Water Viscosity at Ts	0.596	cp	Foster&Chrostowski 1987	
				AT-C	Averaging Time (Cancer)	25550	days	U.S. EPA, 1989	
				AT-N	Averaging Time (Noncancer)	8760	days	U.S. EPA ,1989	

Notes:

1 - Adults were evaluated as one age group (7 - 30 years) for non-mutagenic chemicals. For chemicals that act via the mutagenic mode of action, residential adults were evaluated as two age groups, 7 - 16 years and 16 - 30 years in accordance with USEPA's Supplemental Guidance of Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005).

Sources

U.S. EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

U.S. EPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Foster, S.A. and P.C. Chrostowski, 1987. Inhalation Exposure to Volatile Organic Contaminants in the Shower.

Unit Intake Calculations

Inhalation Intake = (EF x ED x ET)/(AT x Ra x CF)

Non-Mutagenic Chemicals		Noncarcinogenic Chemicals	
Cancer Inhalation Intake (Age 6 - 30) =	1.37E-02	Noncancer Inhalation Intake =	4.00E-02
Mutagenic Chemicals			
Cancer Inhalation Intake (Age 6 - 16) =	5.71E-03		
Cancer Inhalation Intake (Age 16 - 30) =	7.99E-03		

RAGS Part D Table 5

Non-Cancer Toxicity Data

LIST OF TABLES
RAGS PART D TABLE 5
NON-CANCER TOXICITY DATA

Table No.

5.1 Non-Cancer Toxicity Data - Oral/Dermal

5.2 Non-Cancer Toxicity Data - Inhalation

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[1]	Absorbed RfD for Dermal[2]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons										
2-Methylnaphthalene	Chronic	4.0E-03	mg/kg/day	1	4.0E-03	mg/kg/day	Respiratory	1000/1	IRIS	8/5/2011
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Subchronic	6.0E-01	mg/kg/day	1	6.0E-01	mg/kg/day	Body Weight	NA	ATSDR	9/2005
	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Body Weight	3000/1	IRIS	8/5/2011
Inorganics										
Arsenic	Chronic	3.0E-04	mg/kg/day	1	3.0E-04	mg/kg/day	Skin, CVS	3/1	IRIS	8/5/2011
Chromium[3]	Subchronic	2.0E-02	mg/kg/day	0.025	5.0E-04	mg/kg/day	None Reported	100/3	HEAST	9/1997
	Chronic	3.0E-03	mg/kg/day	0.025	7.5E-05	mg/kg/day	None Reported	300/3	IRIS	8/5/2011
Copper	Subchronic	1.0E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Gastrointestinal	NA	ATSDR	10/2004
	Chronic	4.0E-02	mg/kg/day	1	4.0E-02	mg/kg/day	Gastrointestinal	NA	HEAST	7/1997
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.
3 - Toxicity values are for hexavalent chromium.

Definitions:
ATSDR = Agency for Toxic Substances and Disease Registry
CVS = Cardiovascular system
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NA = Not applicable/not available

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
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Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD[1]		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons									
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Chronic	3.0E-03	mg/m^3	8.6E-04	(mg/kg/day)	Respiratory	3000/1	IRIS	8/5/2011
Inorganics									
Arsenic	Chronic	1.5E-05	mg/m^3	4.3E-06	(mg/kg/day)	NA	NA	Cal EPA	9/2009
Chromium[2]	Chronic	1.0E-04	mg/m3	2.9E-05	(mg/kg/day)	Respiratory	300/1	IRIS	8/5/2011
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - Extrapolated RfD = RfC *$20m^3$/day / 70 kg
2 - Toxicity values are for hexavalent chromium.
Definitions:
Cal EPA = California Environmental Protection Agency, Technical Support Document for Describing Available Cancer Slope Factors, September 2009.
IRIS = Integrated Risk Information System
NA = Not applicable/not available

RAGS Part D Table 6

Cancer Toxicity Data

LIST OF TABLES
RAGS PART D TABLE 6
CANCER TOXICITY DATA

Table No.

6.1	Cancer Toxicity Data - Oral/Dermal
6.2	Cancer Toxicity Data - Inhalation

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal[1]	Absorbed Cancer Slope Factor for Dermal[2]		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons								
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene[3]	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Benzo(a)pyrene[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	8/5/2011
Benzo(a)pyrene Equivalents[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	IRIS	8/5/2011
Benzo(b)fluoranthene[3]	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Benzo(k)fluoranthene[3]	7.3E-02	$(mg/kg/day)^{-1}$	1	7.3E-02	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Dibenzo(a,h)anthracene[3]	7.3E+00	$(mg/kg/day)^{-1}$	1	7.3E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Indeno(1,2,3-cd)pyrene[3]	7.3E-01	$(mg/kg/day)^{-1}$	1	7.3E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	ECAO	1993
Naphthalene	NA	NA	NA	NA	NA	C / Possible human carcinogen	NA	NA
Inorganics								
Arsenic	1.5E+00	$(mg/kg/day)^{-1}$	1	1.5E+00	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	8/5/2011
Chromium[3][4]	5.0E-01	$(mg/kg/day)^{-1}$	0.025	2.0E+01	$(mg/kg/day)^{-1}$	D (Not classifiable as to human carcinogenicity)	NJDEP	4/8/2009
Copper	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 - USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
2 - Adjusted cancer slope factor for dermal = Oral cancer slope factor / Oral Absorption Efficiency for Dermal.
3 - The carcinogenic PAHs and hexavalent chromium are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).
4 - Toxicity values are for hexavalent chromium.

ECAO = Environmental Criteria and Assessment Office (EPA, 1993).
IRIS = Integrated Risk Information System.
NA = Not Available.
NJDEP = New Jersey Department of Environmental Protection, Derivation of Ingestion-Based Soil Remediation Criterion for Cr+6 Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate, April 8, 2009.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
HUMAN HEALTH RISK ASSESSMENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor[1]		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Polycyclic Aromatic Hydrocarbons							
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(a)pyrene[2]	1.1E-03	$(ug/m^3)^{-1}$	3.9E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(a)pyrene Equivalents[2]	1.1E-03	$(ug/m^3)^{-1}$	3.9E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(b)fluoranthene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Benzo(k)fluoranthene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Dibenzo(a,h)anthracene[2]	1.2E-03	$(ug/m^3)^{-1}$	4.2E+00	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Indeno(1,2,3-cd)pyrene[2]	1.1E-04	$(ug/m^3)^{-1}$	3.9E-01	$(mg/kg/day)^{-1}$	B2 / Probable human carcinogen	Cal EPA(1)	9/2009
Naphthalene	3.4E-05	$(ug/m^3)^{-1}$	1.2E-01	$(mg/kg/day)^{-1}$	C / Possible human carcinogen	IRIS	8/5/2011
Inorganics							
Arsenic	4.3E-03	$(ug/m^3)^{-1}$	1.5E+01	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	8/5/2011
Chromium[3]	8.4E-02	$(ug/m^3)^{-1}$	2.9E+02	$(mg/kg/day)^{-1}$	A / Known human carcinogen	IRIS	8/5/2011
Copper	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA

Notes:

1 - Inhalation CSF = Unit Risk * 70 kg / $20m^3$/day.

2 - The carcinogenic PAHs and hexavalent chromium are considered to act via the mutagenic mode of action. These chemicals are evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

3 - The toxicity values are for hexavalent chromium.

IRIS = Integrated Risk Information System.

NA = Not Available.

Cal EPA(1) = California Environmental Protection Agency, Technical Support Document for Describing Available Cancer Slope Factors, September 2009.

RAGS Part D Table 7

Calculation of Cancer Risks and Non-Cancer Hazards

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RAGS PART D TABLE 7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Table No.

REASONABLE MAXIMUM EXPOSURES

7.1.RME Construction Workers
7.2.RME Industrial Workers
7.3.RME Child Recreational Users
7.4.RME Adult Recreational Users
7.5.RME Child Residents
7.6.RME Adult Residents

TABLE 7.1 RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	2.00	mg/kg	9 2E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	6.7E-07	6.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10 0	mg/kg	4.6E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	6.9E-07	3 2E-05	(mg/kg/day)	3 0E-04	(mg/kg/day)	0.1
				Chromium VI	15.8	mg/kg	7.3E-07	(mg/kg/day)	5 0E-01	(mg/kg/day)$^{-1}$	3.6E-07	5.1E-05	(mg/kg/day)	3 0E-03	(mg/kg/day)	0 02
				Copper	213	mg/kg	9.8E-06	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	6 9E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.07
				Lead	267	mg/kg	1.2E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	8 6E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.7E-06					0 2
			Dermal	Benzo(a)pyrene Equivalents	2.00	mg/kg	3 6E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.6E-07	2.5E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	4 2E-08	(mg/kg/day)	1 5E+00	(mg/kg/day)$^{-1}$	6 2E-08	2.9E-06	(mg/kg/day)	3 0E-04	(mg/kg/day)	0 010
				Chromium VI	15 8	mg/kg	0.0E+00	(mg/kg/day)	2 0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7 5E-05	(mg/kg/day)	--
				Copper	213	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	1.0E-02	(mg/kg/day)	--
				Lead	267	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								3 2E-07					0 010
		Exposure Point Total									2.1E-06					0 2
	Exposure Medium Total										2.1E-06					0.2
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1 4E-6	mg/m^3	4 6E-09	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	5 0E-09	3 2E-07	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	7 0E-6	mg/m^3	2.3E-08	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	9.8E-08	1.6E-06	(mg/m^3)	1.5E-05	(mg/m^3)	0.1
				Chromium VI	1 1E-5	mg/m^3	3 6E-08	(mg/m^3)	8 4E-02	(ug/m^3)$^{-1}$	3.0E-06	2.5E-06	(mg/m^3)	1 0E-04	(mg/m^3)	0.03
				Copper	1.5E-4	mg/m^3	4.9E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3 4E-05	(mg/m^3)	NA	(mg/m^3)	--
				Lead	1 9E-4	mg/m^3	6.1E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4 3E-05	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3.1E-06					0.1
		Exposure Point Total									3.1E-06					0.1
	Exposure Medium Total										3.1E-06					0 1
Medium Total											5.2E-08					0 3
Subsurface Soil	Subsurface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	1.60	mg/kg	7 4E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	5.4E-07	5.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	4 8E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	7.2E-07	3.4E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0 1
				Chromium VI	15 9	mg/kg	7 3E-07	(mg/kg/day)	5 0E-01	(mg/kg/day)$^{-1}$	3 7E-07	5.1E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.02
				Lead	300	mg/kg	1 4E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	9 7E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.6E-06					0.1
			Dermal	Benzo(a)pyrene Equivalents	1.60	mg/kg	2.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.1E-07	2.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	4.3E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	6.5E-08	3.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01
				Chromium VI	15.9	mg/kg	0 0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Lead	300	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.7E-07					0.01
		Exposure Point Total									1.9E-06					0 1
	Exposure Medium Total										1.9E-06					0.1
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1.1E-6	mg/m^3	3.6E-09	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	4.0E-09	2.6E-07	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	7.3E-6	mg/m^3	2.4E-08	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.0E-07	1.7E-06	(mg/m^3)	1.5E-05	(mg/m^3)	0.1
				Chromium VI	1.1E-5	mg/m^3	3.6E-08	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	3 0E-06	2.5E-06	(mg/m^3)	1 0E-04	(mg/m^3)	0.03
				Lead	2.1E-4	mg/m^3	6 8E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	4.8E-05	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								3 2E-06					0.1
		Exposure Point Total									3 2E-06					0 1
	Exposure Medium Total										3.2E-06					0 1
Medium Total											5.1E-06					0 3

TABLE 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Groundwater	Atwater	Ingestion	2-Methylnaphthalene	24.0	ug/L	1.2E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	8.5E-07	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.0002
				Benzo(a)pyrene Equivalents	0.029	ug/L	1.5E-11	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	1.1E-10	1.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Naphthalene	120	ug/L	6.0E-08	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	4.2E-06	(mg/kg/day)	6.0E-01	(mg/kg/day)	0.000007
				Arsenic	6.20	ug/L	3.1E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	4.7E-09	2.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0007
				Chromium VI	0.360	ug/L	1.8E-10	(mg/kg/day)	5.0E-01	$(mg/kg/day)^{-1}$	9.1E-11	1.3E-08	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.000004
			Exp. Route Total								4.9E-09					0.0010
			Dermal	2-Methylnaphthalene	24.0	ug/L	1.7E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	1.2E-04	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.03
				Benzo(a)pyrene Equivalents	0.029	ug/L	0.0E+00	(mg/kg/day)	7.3E+00	$(mg/kg/day)^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Naphthalene	120	ug/L	4.3E-06	(mg/kg/day)	NA	$(mg/kg/day)^{-1}$	--	3.0E-04	(mg/kg/day)	6.0E-01	(mg/kg/day)	0.0005
				Arsenic	6.20	ug/L	4.1E-09	(mg/kg/day)	1.5E+00	$(mg/kg/day)^{-1}$	6.2E-09	2.9E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0010
				Chromium VI	0.360	ug/L	4.8E-10	(mg/kg/day)	2.0E+01	$(mg/kg/day)^{-1}$	9.6E-09	3.3E-08	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.0004
			Exp. Route Total								1.6E-08					0.03
		Exposure Point Total									2.1E-08					0.03
	Exposure Medium Total										2.1E-08					0.03
	Air	Atwater	Inhalation	2-Methylnaphthalene	6.7E-4	mg/m^3	4.0E-07	(mg/m^3)	NA	$(ug/m^3)^{-1}$	--	2.8E-05	(mg/m^3)	NA	(mg/m^3)	--
				Benzo(a)pyrene Equivalents	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	1.1E-03	$(ug/m^3)^{-1}$	--	0.0E+00	(mg/m^3)	NA	(mg/m^3)	--
				Naphthalene	3.5E-3	mg/m^3	2.0E-06	(mg/m^3)	3.4E-05	$(ug/m^3)^{-1}$	7.0E-08	1.4E-04	(mg/m^3)	3.0E-03	(mg/m^3)	0.05
				Arsenic	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	4.3E-03	$(ug/m^3)^{-1}$	--	0.0E+00	(mg/m^3)	1.5E-05	(mg/m^3)	--
				Chromium VI	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	8.4E-02	$(ug/m^3)^{-1}$	--	0.0E+00	(mg/m^3)	1.0E-04	(mg/m^3)	--
			Exp. Route Total								7.0E-08					0.05
		Exposure Point Total									7.0E-08					0.05
	Exposure Medium Total										7.0E-08					0.05
Medium Total											9.0E-08					0.08
										Total of Receptor Risks Across All Media	1.0E-05			Total of Receptor Hazards Across All Media		0.7

TABLE 7 2 RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Current/Future
Receptor Population: Industrial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	2.00	mg/kg	7.0E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	5.1E-06	2 0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10 0	mg/kg	3.5E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	5 2E-06	9.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Chromium VI	15 8	mg/kg	5 5E-06	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	2.8E-06	1.5E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.005
				Copper	213	mg/kg	7.4E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.1E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.005
				Lead	267	mg/kg	9.3E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.6E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.3E-05					0 04
			Dermal	Benzo(a)pyrene Equivalents	2.00	mg/kg	6.0E-07	(mg/kg/day)	7 3E+00	(mg/kg/day)$^{-1}$	4.4E-06	1.7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	6.9E-07	(mg/kg/day)	1 5E+00	(mg/kg/day)$^{-1}$	1.0E-06	1 9E-06	(mg/kg/day)	3 0E-04	(mg/kg/day)	0 006
				Chromium VI	15 8	mg/kg	0 0E+00	(mg/kg/day)	2 0E+01	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	7 5E-05	(mg/kg/day)	--
				Copper	213	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Lead	267	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								5.4E-06					0.006
		Exposure Point Total									1.9E-05					0.05
	Exposure Medium Total										1.9E-05					0 05
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	2.1E-9	mg/m^3	1.7E-10	(mg/m^3)	1 1E-03	(ug/m^3)$^{-1}$	1.9E-10	4 8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	8 6E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	3.7E-09	2.4E-09	(mg/m^3)	1.5E-05	(mg/m^3)	0 0002
				Chromium VI	1.7E-8	mg/m^3	1 4E-09	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	1.1E-07	3.8E-09	(mg/m^3)	1.0E-04	(mg/m^3)	0 00004
				Copper	2.2E-7	mg/m^3	1 8E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	5.1E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.8E-7	mg/m^3	2 3E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	6.4E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1 2E-07					0 0002
		Exposure Point Total									1.2E-07					0.0002
	Exposure Medium Total										1.2E-07					0.0002
Medium Total											1.9E-05					0 05
Subsurface Soil	Subsurface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	1.60	mg/kg	5.6E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	4 1E-06	1 6E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	3.6E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	5.5E-06	1 0E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03
				Chromium VI	15.9	mg/kg	5.6E-06	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	2.8E-06	1 6E-05	(mg/kg/day)	3 0E-03	(mg/kg/day)	0.005
				Lead	300	mg/kg	1.0E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2 9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.2E-05					0.04
			Dermal	Benzo(a)pyrene Equivalents	1.60	mg/kg	4.8E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.5E-06	1 3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	7 2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.1E-06	2.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.007
				Chromium VI	15.9	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Lead	300	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								4.6E-06					0.007
		Exposure Point Total									1 7E-05					0 05
	Exposure Medium Total										1.7E-05					0.05
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1 7E-9	mg/m^3	1 4E-10	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	1.5E-10	3 8E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	8.9E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	3.8E-09	2.5E-09	(mg/m^3)	1.5E-05	(mg/m^3)	0.0002
				Chromium VI	1.7E-8	mg/m^3	1.4E-09	(mg/m^3)	8 4E-02	(ug/m^3)$^{-1}$	1.1E-07	3 8E-09	(mg/m^3)	1.0E-04	(mg/m^3)	0 00004
				Lead	3.2E-7	mg/m^3	2.6E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	7.2E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								1 2E-07					0 0002
		Exposure Point Total									1.2E-07					0.0002
	Exposure Medium Total										1 2E-07					0 0002
Medium Total											1.7E-05					0 05
										Total of Receptor Risks Across All Media	3.6E-05			Total of Receptor Hazards Across All Media		0 10

TABLE 7.3.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	2.00	mg/kg	5.3E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.9E-05	1.2E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	5.0E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	7.5E-06	5.8E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.2
				Chromium VI	15.8	mg/kg	4.2E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	2.1E-05	9.2E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.03
				Copper	213	mg/kg	1.1E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.2E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.03
				Lead	267	mg/kg	1.3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.6E-03	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								6.8E-05					0.3
			Dermal	Benzo(a)pyrene Equivalents	2.00	mg/kg	1.9E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.4E-05	4.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	4.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	6.3E-07	4.9E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Chromium VI	15.8	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Copper	213	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Lead	267	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.5E-05					0.02
		Exposure Point Total									8.2E-05					0.3
	Exposure Medium Total										*8.2E-05*					*0.3*
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	2.1E-9	mg/m^3	7.0E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	7.7E-11	1.5E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	5.6E-11	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	2.8E-10	7.7E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00005
				Chromium VI	1.7E-8	mg/m^3	5.6E-10	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	4.7E-08	1.2E-09	(mg/m^3)	1.0E-04	(mg/m^3)	0.00001
				Copper	2.2E-7	mg/m^3	1.4E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.6E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.8E-7	mg/m^3	1.8E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.1E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.7E-08					0.00006
		Exposure Point Total									4.7E-08					0.00006
	Exposure Medium Total										4.7E-08					0.00006
Medium Total											8.3E-05					0.3
Subsurface Soil	Subsurface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	1.60	mg/kg	4.3E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.1E-05	9.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	5.2E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	7.8E-06	6.1E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.2
				Chromium VI	15.9	mg/kg	4.2E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	2.1E-05	9.3E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.03
				Lead	300	mg/kg	1.5E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.8E-03	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								6.0E-05					0.2
			Dermal	Benzo(a)pyrene Equivalents	1.60	mg/kg	1.6E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.1E-05	3.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	4.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	6.6E-07	5.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Chromium VI	15.9	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Lead	300	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.2E-05					0.02
		Exposure Point Total									7.2E-05					0.3
	Exposure Medium Total										7.2E-05					0.3
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1.7E-9	mg/m^3	5.6E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	6.2E-11	1.2E-10	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	*1.1E-8*	mg/m^3	*6.9E-11*	(mg/m^3)	*4.3E-03*	(ug/m^3)$^{-1}$	*2.9E-10*	*8.0E-10*	(mg/m^3)	*1.5E-05*	(mg/m^3)	*0.00005*
				Chromium VI	1.7E-8	mg/m^3	5.6E-10	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	4.7E-08	1.2E-09	(mg/m^3)	1.0E-04	(mg/m^3)	0.00001
				Lead	3.2E-7	mg/m^3	2.0E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.3E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.7E-08					0.00007
		Exposure Point Total									4.7E-08					0.00007
	Exposure Medium Total										4.7E-08					0.00007
Medium Total											7.2E-05					0.3

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.4.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	2.00	mg/kg	7.9E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	5.7E-06	1.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	2.1E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	3.2E-06	6.3E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Chromium VI	15.8	mg/kg	8.2E-06	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	3.1E-06	9.9E-06	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.003
				Copper	213	mg/kg	4.6E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.3E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.003
				Lead	267	mg/kg	5.7E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.7E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.2E-05					0.03
			Dermal	Benzo(a)pyrene Equivalents	2.00	mg/kg	4.1E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.0E-06	6.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	2.6E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	3.9E-07	7.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002
				Chromium VI	15.8	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Copper	213	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Lead	267	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total	-							3.4E-06					0.002
		Exposure Point Total									1.5E-05					0.03
	Exposure Medium Total										1.5E-05					0.03
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	2.1E-9	mg/m^3	6.0E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	6.6E-11	9.6E-11	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	1.6E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	7.1E-10	4.8E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00003
				Chromium VI	1.7E-8	mg/m^3	4.8E-10	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	4.0E-08	7.8E-10	(mg/m^3)	1.0E-04	(mg/m^3)	0.000008
				Copper	2.2E-7	mg/m^3	3.5E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.0E-08	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.8E-7	mg/m^3	4.4E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.3E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.1E-08					0.00004
		Exposure Point Total									4.1E-08					0.00004
	Exposure Medium Total										4.1E-08					0.00004
Medium Total											1.5E-05					0.03
Subsurface Soil	Subsurface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	1.60	mg/kg	6.3E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	4.6E-06	1.0E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	2.2E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	3.3E-06	6.5E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02
				Chromium VI	15.9	mg/kg	6.3E-06	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	3.1E-06	1.0E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.003
				Lead	300	mg/kg	6.4E-05	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	1.9E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.1E-05					0.03
			Dermal	Benzo(a)pyrene Equivalents	1.60	mg/kg	3.3E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.4E-06	5.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	2.7E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	4.0E-07	7.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Chromium VI	15.9	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Lead	300	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.8E-06					0.003
		Exposure Point Total									1.4E-05					0.03
	Exposure Medium Total										1.4E-05					0.03
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1.7E-9	mg/m^3	4.8E-11	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	5.3E-11	7.7E-11	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	1.7E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	7.4E-10	5.0E-10	(mg/m^3)	1.5E-05	(mg/m^3)	0.00003
				Chromium VI	1.7E-8	mg/m^3	4.8E-10	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	4.0E-08	7.6E-10	(mg/m^3)	1.0E-04	(mg/m^3)	0.000008
				Lead	3.2E-7	mg/m^3	4.9E-09	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	1.4E-08	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								4.1E-08					0.00004
		Exposure Point Total									4.1E-08					0.00004
	Exposure Medium Total										4.1E-08					0.00004
Medium Total											1.4E-05					0.03
										Total of Receptor Risks Across All Media	2.9E-05			Total of Receptor Hazards Across All Media		0.06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	2.00	mg/kg	1.2E-05	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	8.5E-05	2.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	1.1E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.6E-05	1.3E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.4
				Chromium VI	15.8	mg/kg	9.2E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	4.6E-05	2.0E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.07
				Copper	213	mg/kg	2.3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.7E-03	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.07
				Lead	267	mg/kg	2.9E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.4E-03	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.5E-04					0.8
			Dermal	Benzo(a)pyrene Equivalents	2.00	mg/kg	4.3E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.1E-05	9.3E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	9.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.4E-06	1.1E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.04
				Chromium VI	15.8	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Copper	213	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Lead	267	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								3.2E-05					0.04
		Exposure Point Total									1.8E-04					0.6
	Exposure Medium Total										1.8E-04					0.6
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	2.1E-9	mg/m^3	9.2E-10	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	1.0E-09	2.0E-09	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	8.7E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	3.7E-09	1.0E-08	(mg/m^3)	1.5E-05	(mg/m^3)	0.0007
				Chromium VI	1.7E-8	mg/m^3	7.3E-09	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	6.1E-07	1.6E-08	(mg/m^3)	1.0E-04	(mg/m^3)	0.0002
				Copper	2.2E-7	mg/m^3	1.8E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.8E-7	mg/m^3	2.3E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.7E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								6.2E-07					0.0008
		Exposure Point Total									6.2E-07					0.0008
	Exposure Medium Total										6.2E-07					0.0008
Medium Total											1.8E-04					0.6
Subsurface Soil	Subsurface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	1.60	mg/kg	9.4E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	6.8E-05	2.0E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	1.1E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.7E-05	1.3E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.4
				Chromium VI	15.9	mg/kg	9.3E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	4.6E-05	2.0E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.07
				Lead	300	mg/kg	3.3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.8E-03	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								1.3E-04					0.5
			Dermal	Benzo(a)pyrene Equivalents	1.60	mg/kg	3.4E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	2.5E-05	7.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	9.6E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	1.4E-06	1.1E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.04
				Chromium VI	15.9	mg/kg	0.0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Lead	300	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.6E-05					0.04
		Exposure Point Total									1.6E-04					0.5
	Exposure Medium Total										1.6E-04					0.5
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1.7E-9	mg/m^3	7.4E-10	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	8.1E-10	1.6E-09	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	9.0E-10	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	3.9E-09	1.0E-08	(mg/m^3)	1.5E-05	(mg/m^3)	0.0007
				Chromium VI	1.7E-8	mg/m^3	7.3E-09	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	6.2E-07	1.6E-08	(mg/m^3)	1.0E-04	(mg/m^3)	0.0002
				Lead	3.2E-7	mg/m^3	2.6E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3.0E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								6.2E-07					0.0009
		Exposure Point Total									6.2E-07					0.0009
	Exposure Medium Total										6.2E-07					0.0009
Medium Total											1.6E-04					0.5

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	*Groundwater*	*Atwater*	*Ingestion*	*2-Methylnaphthalene*	*24 0*	*ug/L*	1.3E-04	*(mg/kg/day)*	NA	*(mg/kg/day)* [1]	--	1.5E-03	*(mg/kg/day)*	4.0E-03	*(mg/kg/day)*	0.4
				Benzo(a)pyrene Equivalents	0.029	ug/L	8.5E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)[-1]	6.2E-06	1.9E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Naphthalene	120	ug/L	6 6E-04	(mg/kg/day)	NA	(mg/kg/day)[-1]	--	7.7E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.4
				Arsenic	6.20	ug/L	3 4E-05	(mg/kg/day)	1.5E+00	(mg/kg/day) [1]	5.1E-05	4.0E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	1 3
				Chromium VI	0.360	ug/L	1.1E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)[-1]	5.3E-06	2.3E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.008
			Exp. Route Total								6.2E-05					2.1
			Dermal	2-Methylnaphthalene	24 0	ug/L	1.7E-04	(mg/kg/day)	NA	(mg/kg/day)[-1]	--	2.0E-03	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.5
				Benzo(a)pyrene Equivalents	0 029	ug/L	0 0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)[-1]	--	0 0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Naphthalene	120	ug/L	4.2E-04	(mg/kg/day)	NA	(mg/kg/day)[-1]	--	4.9E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.2
				Arsenic	6.20	ug/L	2.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) [1]	3.4E-07	2 6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.009
				Chromium VI	0.360	ug/L	1.4E-07	(mg/kg/day)	2.0E+01	(mg/kg/day)[-1]	2.8E-06	3.0E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0 004
			Exp. Route Total								3 1E-06					0 8
		Exposure Point Total									6.6E-05					2.9
	Exposure Medium Total										6.6E-05					2.9
	Air	Atwater	Inhalation	2-Methylnaphthalene	2.5E-2	mg/m^3	8.7E-05	(mg/m^3)	NA	(ug/m^3)[1]	--	1 0E-03	(mg/m^3)	NA	(mg/m^3)	--
				Benzo(a)pyrene Equivalents	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	1.1E-03	(ug/m^3)[-1]	--	0 0E+00	(mg/m^3)	NA	(mg/m^3)	--
				Naphthalene	1.3E-1	mg/m^3	4.3E-04	(mg/m^3)	3 4E-05	(ug/m^3)[-1]	1.5E-05	5.1E-03	(mg/m^3)	3.0E-03	(mg/m^3)	1.7
				Arsenic	0 0E+0	mg/m^3	0.0E+00	(mg/m^3)	4 3E-03	(ug/m^3)[-1]	--	0 0E+00	(mg/m^3)	1.5E-05	(mg/m^3)	--
				Chromium VI	0.0E+0	mg/m^3	0 0E+00	(mg/m^3)	8 4E-02	(ug/m^3)[-1]	--	0 0E+00	(mg/m^3)	1.0E-04	(mg/m^3)	--
			Exp. Route Total								1.5E-05					1.7
		Exposure Point Total									1.5E-05					1.7
	Exposure Medium Total										1.5E-05					1.7
Medium Total											8.0E-05					4.5
										Total of Receptor Risks Across All Media	4 2E-04			Total of Receptor Hazards Across All Media		5.7

Notes:

1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 7.6 RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	2 00	mg/kg	1.7E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.3E-05	2 7E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10 0	mg/kg	4.7E-06	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	7.0E-06	1 4E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.05
				Chromium VI	15.8	mg/kg	1.4E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	6.8E-06	2.2E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.007
				Copper	213	mg/kg	1.0E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	2.9E-04	(mg/kg/day)	4.0E-02	(mg/kg/day)	0.007
				Lead	267	mg/kg	1.3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	3.7E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2 6E-05					0.06
			Dermal	Benzo(a)pyrene Equivalents	2.00	mg/kg	8.9E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	6.5E-06	1 4E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.0	mg/kg	5 6E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	8 4E-07	1 6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.005
				Chromium VI	15.8	mg/kg	0 0E+00	(mg/kg/day)	2 0E+01	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Copper	213	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	4.0E-02	(mg/kg/day)	--
				Lead	267	mg/kg	0 0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								7 4E-06					0 005
		Exposure Point Total									3 4E-05					0.07
	Exposure Medium Total										3.4E-05					0.07
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	2 1E-9	mg/m^3	1 3E-09	(mg/m^3)	1 1E-03	(ug/m^3)$^{-1}$	1.4E-09	2.0E-09	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	3.5E-09	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1 5E-08	1.0E-08	(mg/m^3)	1.5E-05	(mg/m^3)	0 0007
				Chromium VI	1.7E-8	mg/m^3	1.0E-08	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	8.4E-07	1.6E-08	(mg/m^3)	1.0E-04	(mg/m^3)	0.0002
				Copper	2.2E-7	mg/m^3	7.4E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.1E-07	(mg/m^3)	NA	(mg/m^3)	--
				Lead	2.8E-7	mg/m^3	9 2E-08	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	2.7E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								8.6E-07					0.0008
		Exposure Point Total									8.6E-07					0 0008
	Exposure Medium Total										8.6E-07					0 0008
Medium Total											3.5E-05					0 07
Subsurface Soil	Subsurface Soil	Atwater	Ingestion	Benzo(a)pyrene Equivalents	1.60	mg/kg	1 4E-06	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	1.0E-05	2.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	4.9E-06	(mg/kg/day)	1 5E+00	(mg/kg/day)$^{-1}$	7.3E-06	1.4E-05	(mg/kg/day)	3 0E-04	(mg/kg/day)	0 05
				Chromium VI	15 9	mg/kg	1 4E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	6.8E-06	2.2E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.007
				Lead	300	mg/kg	1 4E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	4.1E-04	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								2.4E-05					0 05
			Dermal	Benzo(a)pyrene Equivalents	1.60	mg/kg	7.1E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	5.2E-06	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	10.4	mg/kg	5 8E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	8.8E-07	1.7E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.006
				Chromium VI	15.9	mg/kg	0 0E+00	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	7.5E-05	(mg/kg/day)	--
				Lead	300	mg/kg	0 0E+00	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	--	0 0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
			Exp. Route Total								6.1E-06					0 006
		Exposure Point Total									3.0E-05					0.06
	Exposure Medium Total										3 0E-05					0 06
	Air	Atwater	Inhalation	Benzo(a)pyrene Equivalents	1.7E-9	mg/m^3	1.0E-09	(mg/m^3)	1 1E-03	(ug/m^3)$^{-1}$	1.1E-09	1.6E-09	(mg/m^3)	NA	(mg/m^3)	--
				Arsenic	1.1E-8	mg/m^3	3.6E-09	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	1.5E-08	1.0E-08	(mg/m^3)	1.5E-05	(mg/m^3)	0 0007
				Chromium VI	1.7E-8	mg/m^3	1.0E-08	(mg/m^3)	8.4E-02	(ug/m^3)$^{-1}$	8.5E-07	1.6E-08	(mg/m^3)	1.0E-04	(mg/m^3)	0 0002
				Lead	3.2E-7	mg/m^3	1.0E-07	(mg/m^3)	NA	(ug/m^3)$^{-1}$	--	3 0E-07	(mg/m^3)	NA	(mg/m^3)	--
			Exp. Route Total								8.6E-07					0.0009
		Exposure Point Total									8.6E-07					0 0009
	Exposure Medium Total										8.6E-07					0.0009
Medium Total											3.1E-05					0 05

TABLE 7.6.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Groundwater	Atwater	Ingestion	2-Methylnaphthalene	24 0	ug/L	2 3E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	6 6E-04	(mg/kg/day)	4 0E-03	(mg/kg/day)	0.2
				Benzo(a)pyrene Equivalents	0.029	ug/L	5 0E-07	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	3.6E-06	7.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Naphthalene	120	ug/L	1 1E-03	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	3 3E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.2
				Arsenic	5.20	ug/L	5 8E-05	(mg/kg/day)	1.5E+00	(mg/kg/day)$^{-1}$	8.7E-05	1.7E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0 6
				Chromium VI	0.360	ug/L	6 2E-06	(mg/kg/day)	5.0E-01	(mg/kg/day)$^{-1}$	3.1E-06	9.9E-06	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.003
			Exp. Route Total								9.4E-05					0 9
			Dermal	2-Methylnaphthalene	24.0	ug/L	3 1E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	9 0E-04	(mg/kg/day)	4.0E-03	(mg/kg/day)	0 2
				Benzo(a)pyrene Equivalents	0 029	ug/L	0 0E+00	(mg/kg/day)	7.3E+00	(mg/kg/day)$^{-1}$	- -	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Naphthalene	120	ug/L	7 4E-04	(mg/kg/day)	NA	(mg/kg/day)$^{-1}$	- -	2.2E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0 1
				Arsenic	6 20	ug/L	3.0E-07	(mg/kg/day)	1 5E+00	(mg/kg/day)$^{-1}$	4.6E-07	8 9E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0 003
				Chromium VI	0.360	ug/L	6.5E-08	(mg/kg/day)	2.0E+01	(mg/kg/day)$^{-1}$	1 3E-06	1.0E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0 001
			Exp. Route Total								1.8E-06					0 3
		Exposure Point Total									9 6E-05					1 2
	Exposure Medium Total										9.6E-05					1.2
	Air	Atwater	Inhalation	2-Methylnaphthalene	2.5E-2	mg/m^3	3 5E-04	(mg/m^3)	NA	(ug/m^3)$^{-1}$	- -	1.0E-03	(mg/m^3)	NA	(mg/m^3)	--
				Benzo(a)pyrene Equivalents	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	1.1E-03	(ug/m^3)$^{-1}$	- -	0 0E+00	(mg/m^3)	NA	(mg/m^3)	--
				Naphthalene	1.3E-1	mg/m^3	1.7E-03	(mg/m^3)	3.4E-05	(ug/m^3)$^{-1}$	5 9E-05	5.1E-03	(mg/m^3)	3.0E-03	(mg/m^3)	1.7
				Arsenic	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	4.3E-03	(ug/m^3)$^{-1}$	- -	0.0E+00	(mg/m^3)	1.5E-05	(mg/m^3)	--
				Chromium VI	0.0E+0	mg/m^3	0.0E+00	(mg/m^3)	8 4E-02	(ug/m^3)$^{-1}$	- -	0.0E+00	(mg/m^3)	1 0E-04	(mg/m^3)	--
			Exp. Route Total								5 9E-05					1.7
		Exposure Point Total									5 9E-05					1.7
	Exposure Medium Total										5.9E-05					1 7
Medium Total											1.5E-04					2.9
										Total of Receptor Risks Across All Media	2.2E-04			Total of Receptor Hazards Across All Media		3 0

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

RAGS Part D Table 9

Summary of Receptor Risks and Hazards for COPCs

LIST OF TABLES
RAGS PART D TABLE 9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.

REASONABLE MAXIMUM EXPOSURES

9.1.RME Construction Workers
9.2.RME Industrial Workers
9.3.RME Child Recreational Users
9.4.RME Adult Recreational Users
9.5.RME Lifelong Recreational Users
9.6.RME Child Residents
9.7.RME Adult Residents
9.8.RME Lifelong Residents

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	7E-07	--	3E-07	--	9E-07	NA	--	--	--	--
			Arsenic	7E-07	--	6E-08	--	8E-07	Skin, CVS	0.1	--	0.010	0.1
			Chromium VI	4E-07	--	--	--	4E-07	None Reported	0.02	--	--	0.02
			Copper	--	--	--	--	--	GS	0.07	--	--	0.07
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	2E-06	--	3E-07	--	2E-06		0.2	--	0.010	0.2
		Exposure Point Total						2E-06					0.2
	Exposure Medium Total							2E-06					0.2
	Air	Atwater	Benzo(a)pyrene Equivalents	--	5E-09	--	--	5E-09	NA	--	--	--	--
			Arsenic	--	1E-07	--	--	1E-07	NA	--	0.1	--	0.1
			Chromium VI	--	3E-06	--	--	3E-06	NA	--	0.03	--	0.03
			Copper	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	3E-06	--	--	3E-06		--	0.1	--	0.1
		Exposure Point Total						3E-06					0.1
	Exposure Medium Total							3E-06					0.1
Medium Total								5E-06					0.3
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	5E-07	--	2E-07	--	7E-07	NA	--	--	--	--
			Arsenic	7E-07	--	6E-08	--	8E-07	Skin, CVS	0.1	--	0.01	0.1
			Chromium VI	4E-07	--	--	--	4E-07	None Reported	0.02	--	--	0.02
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	2E-06	--	3E-07	--	2E-06		0.1	--	0.01	0.1
		Exposure Point Total						2E-06					0.1
	Exposure Medium Total							2E-06					0.1
	Air	Atwater	Benzo(a)pyrene Equivalents	--	4E-09	--	--	4E-09	NA	--	--	--	--
			Arsenic	--	1E-07	--	--	1E-07	NA	--	0.1	--	0.1
			Chromium VI	--	3E-06	--	--	3E-06	NA	--	0.03	--	0.03
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	3E-06	--	--	3E-06		--	0.1	--	0.1
		Exposure Point Total						3E-06					0.1
	Exposure Medium Total							3E-06					0.1
Medium Total								5E-06					0.3

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY
PAGE 2 OF 2

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Atwater	2-Methylnaphthalene	- -	--	- -	--	- -	Respiratory	0.0002	--	0.03	0.03
			Benzo(a)pyrene Equivalents	1E-10	--	- -	--	1E-10	NA	--	--	--	--
			Naphthalene	- -	--	- -	--	- -	Body Weight	0.000007	--	0.0005	0.0005
			Arsenic	5E-09	--	6E-09	--	1E-08	Skin, CVS	0.0007	--	0.0010	0.002
			Chromium VI	9E-11	--	1E-08	--	1E-08	None Reported	0.000004	--	0.0004	0.0005
			Chemical Total	5E-09	--	2E-08	--	2E-08		0.0010	--	0.03	0.03
		Exposure Point Total						2E-08					0.03
	Exposure Medium Total							2E-08					0.03
	Air	Atwater	2-Methylnaphthalene	--	- -	--	--	- -	NA	--	--	--	--
			Benzo(a)pyrene Equivalents	--	- -	--	--	- -	NA	--	--	--	--
			Naphthalene	--	7E-08	--	--	7E-08	Respiratory	--	0.05	--	0.05
			Arsenic	--	- -	--	--	- -	NA	--	--	--	--
			Chromium VI	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	7E-08	--	--	7E-08		- -	0.05	- -	0.05
		Exposure Point Total						7E-08					0.05
	Exposure Medium Total							7E-08					0.05
Medium Total								9E-08					0.08
Receptor Total							Receptor Risk Total	1E-05				Receptor HI Total	0.7

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI	0.0005
Total GS HI	0.07
Total Respiratory HI	0.08

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Current/Future
Receptor Population: Industrial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	5E-06	--	4E-06	--	9E-06	NA	--	--	--	--
			Arsenic	5E-06	--	1E-06	--	6E-06	Skin, CVS	0.03	--	0.006	0.04
			Chromium VI	3E-06	--	--	--	3E-06	None Reported	0.005	--	--	0.005
			Copper	--	--	--	--	--	GS	0.005	--	--	0.005
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	1E-05	--	5E-06	--	2E-05		0.04	--	0.006	0.05
		Exposure Point Total						2E-05					0.05
	Exposure Medium Total							2E-05					0.05
	Air	Atwater	Benzo(a)pyrene Equivalents	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Arsenic	--	4E-09	--	--	4E-09	NA	--	0.0002	--	0.0002
			Chromium VI	--	1E-07	--	--	1E-07	NA	--	0.00004	--	0.00004
			Copper	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	1E-07	--	--	1E-07		--	0.0002	--	0.0002
		Exposure Point Total						1E-07					0.0002
	Exposure Medium Total							1E-07					0.0002
Medium Total								2E-05					0.05
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	4E-06	--	4E-06	--	8E-06	NA	--	--	--	--
			Arsenic	5E-06	--	1E-06	--	7E-06	Skin, CVS	0.03	--	0.007	0.04
			Chromium VI	3E-06	--	--	--	3E-06	None Reported	0.005	--	--	0.005
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	1E-05	--	5E-06	--	2E-05		0.04	--	0.007	0.05
		Exposure Point Total						2E-05					0.05
	Exposure Medium Total							2E-05					0.05
	Air	Atwater	Benzo(a)pyrene Equivalents	--	2E-10	--	--	2E-10	NA	--	--	--	--
			Arsenic	--	4E-09	--	--	4E-09	NA	--	0.0002	--	0.0002
			Chromium VI	--	1E-07	--	--	1E-07	NA	--	0.00004	--	0.00004
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	1E-07	--	--	1E-07		--	0.0002	--	0.0002
		Exposure Point Total						1E-07					0.0002
	Exposure Medium Total							1E-07					0.0002
Medium Total								2E-05					0.05

Total CVS HI	0.08
Total GS HI	0.005
Total None Reported HI	0.01
Total Skin HI	0.08
Total NA HI	0.0004

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	4E-05	--	1E-05	--	5E-05	NA	--	--	--	--
			Arsenic	8E-06	--	6E-07	--	8E-06	Skin, CVS	0.2	--	0.02	0.2
			Chromium VI	2E-05	--	--	--	2E-05	None Reported	0.03	--	--	0.03
			Copper	--	--	--	--	--	GS	0.03	--	--	0.03
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	7E-05	--	1E-05	--	8E-05		0.3	--	0.02	0.3
		Exposure Point Total						8E-05					0.3
	Exposure Medium Total							8E-05					0.3
	Air	Atwater	Benzo(a)pyrene Equivalents	--	8E-11	--	--	8E-11	NA	--	--	--	--
			Arsenic	--	3E-10	--	--	3E-10	NA	--	0.00005	--	0.00005
			Chromium VI	--	5E-08	--	--	5E-08	NA	--	0.00001	--	0.00001
			Copper	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	5E-08	--	--	5E-08		--	0.00006	--	0.00006
		Exposure Point Total						5E-08					0.00006
	Exposure Medium Total							*5E-08*					*0.00006*
Medium Total								8E-05					0.3
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	3E-05	--	1E-05	--	4E-05	NA	--	--	--	--
			Arsenic	8E-06	--	7E-07	--	8E-06	Skin, CVS	0.2	--	0.02	0.2
			Chromium VI	2E-05	--	--	--	2E-05	None Reported	0.03	--	--	0.03
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	6E-05	--	1E-05	--	7E-05		0.2	--	0.02	0.3
		Exposure Point Total						7E-05					0.3
	Exposure Medium Total							7E-05					0.3
	Air	Atwater	Benzo(a)pyrene Equivalents	--	6E-11	--	--	6E-11	NA	--	--	--	--
			Arsenic	--	3E-10	--	--	3E-10	NA	--	0.00005	--	0.00005
			Chromium VI	--	5E-08	--	--	5E-08	NA	--	0.00001	--	0.00001
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	5E-08	--	--	5E-08		--	0.00007	--	0.00007
		Exposure Point Total						5E-08					0.00007
	Exposure Medium Total							5E-08					0.00007
Medium Total								7E-05					0.3

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CVS HI	0.4
Total GS HI	0.03
Total None Reported HI	0.06
Total Skin HI	0.4
Total NA HI	0.0001

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	6E-06	--	3E-06	--	9E-06	NA	--	--	--	--
			Arsenic	3E-06	--	4E-07	--	4E-06	Skin, CVS	0.02	--	0.002	0.02
			Chromium VI	3E-06	--	--	--	3E-06	None Reported	0.003	--	--	0.003
			Copper	--	--	--	--	--	GS	0.003	--	--	0.003
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	1E-05	--	3E-06	--	2E-05		0.03	--	0.002	0.03
		Exposure Point Total						2E-05					0.03
	Exposure Medium Total							2E-05					0.03
	Air	Atwater	Benzo(a)pyrene Equivalents	--	7E-11	--	--	7E-11	NA	--	--	--	--
			Arsenic	--	7E-10	--	--	7E-10	NA	--	0.00003	--	0.00003
			Chromium VI	--	4E-08	--	--	4E-08	NA	--	0.000008	--	0.000008
			Copper	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	4E-08	--	--	4E-08		--	0.00004	--	0.00004
		Exposure Point Total						4E-08					0.00004
	Exposure Medium Total							4E-08					0.00004
Medium Total								2E-05					0.03
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	5E-06	--	2E-06	--	7E-06	NA	--	--	--	--
			Arsenic	3E-06	--	4E-07	--	4E-06	Skin, CVS	0.02	--	0.003	0.02
			Chromium VI	3E-06	--	--	--	3E-06	None Reported	0.003	--	--	0.003
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	1E-05	--	3E-06	--	1E-05		0.03	--	0.003	0.03
		Exposure Point Total						1E-05					0.03
	Exposure Medium Total							1E-05					0.03
	Air	Atwater	Benzo(a)pyrene Equivalents	--	5E-11	--	--	5E-11	NA	--	--	--	--
			Arsenic	--	7E-10	--	--	7E-10	NA	--	0.00003	--	0.00003
			Chromium VI	--	4E-08	--	--	4E-08	NA	--	0.000008	--	0.000008
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	4E-08	--	--	4E-08		--	0.00004	--	0.00004
		Exposure Point Total						4E-08					0.00004
	Exposure Medium Total							4E-08					0.00004
Medium Total								1E-05					0.03
Receptor Total							Receptor Risk Total	3E-05				Receptor HI Total	0.06

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total CVS HI	0.05
Total GS HI	0.003
Total None Reported HI	0.007
Total Skin HI	0.05
Total NA HI	0.00008

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Recreational Users
Receptor Age: Lifelong

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	4E-05	--	2E-05	--	6E-05					
			Arsenic	1E-05	--	1E-06	--	1E-05					
			Chromium VI	2E-05	--	- -	--	2E-05					
			Copper	- -	--	- -	--	- -					
			Lead	- -	--	- -	--	- -					
			Chemical Total	8E-05	--	2E-05	--	1E-04					
		Exposure Point Total						1E-04					
	Exposure Medium Total							1E-04					
	Air	Atwater	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10					
			Arsenic	--	1E-09	--	--	1E-09					
			Chromium VI	--	9E-08	--	--	9E-08					
			Copper	--	- -	--	--	- -					
			Lead	--	- -	--	--	- -					
			Chemical Total	--	9E-08	--	--	9E-08					
		Exposure Point Total						9E-08					
	Exposure Medium Total							9E-08					
Medium Total								1E-04					
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	4E-05	--	1E-05	--	5E-05					
			Arsenic	1E-05	--	1E-06	--	1E-05					
			Chromium VI	2E-05	--	- -	--	2E-05					
			Lead	- -	--	- -	--	- -					
			Chemical Total	7E-05	--	1E-05	--	9E-05					
		Exposure Point Total						9E-05					
	Exposure Medium Total							9E-05					
	Air	Atwater	Benzo(a)pyrene Equivalents	--	1E-10	--	--	1E-10					
			Arsenic	--	1E-09	--	--	1E-09					
			Chromium VI	--	9E-08	--	--	9E-08					
			Lead	--	- -	--	--	- -					
			Chemical Total	--	9E-08	--	--	9E-08					
		Exposure Point Total						9E-08					
	Exposure Medium Total							9E-08					
Medium Total								9E-05					
Receptor Total							Receptor Risk Total	2E-04					

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	9E-05	--	3E-05	--	1E-04	NA	--	--	--	--
			Arsenic	2E-05	--	1E-06	--	2E-05	Skin, CVS	0.4	--	0.04	0.5
			Chromium VI	5E-05	--	--	--	5E-05	None Reported	0.07	--	--	0.07
			Copper	--	--	--	--	--	GS	0.07	--	--	0.07
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	1E-04	--	3E-05	--	2E-04		0.6	--	0.04	0.6
		Exposure Point Total						2E-04					0.6
	Exposure Medium Total							2E-04					0.6
	Air	Atwater	Benzo(a)pyrene Equivalents	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Arsenic	--	4E-09	--	--	4E-09	NA	--	0.0007	--	0.0007
			Chromium VI	--	6E-07	--	--	6E-07	NA	--	0.0002	--	0.0002
			Copper	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	6E-07	--	--	6E-07		--	0.0008	--	0.0008
		Exposure Point Total						6E-07					0.0008
	Exposure Medium Total							6E-07					0.0008
Medium Total								2E-04					0.6
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	7E-05	--	2E-05	--	9E-05	NA	--	--	--	--
			Arsenic	2E-05	--	1E-06	--	2E-05	Skin, CVS	0.4	--	0.04	0.5
			Chromium VI	5E-05	--	--	--	5E-05	None Reported	0.07	--	--	0.07
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	1E-04	--	3E-05	--	2E-04		0.5	--	0.04	0.5
		Exposure Point Total						2E-04					0.5
	Exposure Medium Total							2E-04					0.5
	Air	Atwater	Benzo(a)pyrene Equivalents	--	8E-10	--	--	8E-10	NA	--	--	--	--
			Arsenic	--	4E-09	--	--	4E-09	NA	--	0.0007	--	0.0007
			Chromium VI	--	6E-07	--	--	6E-07	NA	--	0.0002	--	0.0002
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	6E-07	--	--	6E-07		--	0.0009	--	0.0009
		Exposure Point Total						6E-07					0.0009
	Exposure Medium Total							6E-07					0.0009
Medium Total								2E-04					0.5

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Atwater	2-Methylnaphthalene	- -	--	- -	--	- -	Respiratory	0.4	--	0.5	0.9
			Benzo(a)pyrene Equivalents	6E-06	--	- -	--	6E-06	NA	--	--	--	--
			Naphthalene	- -	--	- -	--	- -	Body Weight	0.4	--	0.2	0.6
			Arsenic	5E-05	--	3E-07	--	5E-05	Skin, CVS	1	--	0.009	1
			Chromium VI	5E-06	--	3E-06	--	8E-06	None Reported	0.008	--	0.004	0.01
			Chemical Total	6E-05	--	3E-06	--	7E-05		2	--	0.8	3
		Exposure Point Total						7E-05					3
	Exposure Medium Total							7E-05					3
	Air	Atwater	2-Methylnaphthalene	--	- -	--	--	- -	NA	--	--	--	--
			Benzo(a)pyrene Equivalents	--	- -	--	--	- -	NA	--	--	--	--
			Naphthalene	--	1E-05	--	--	1E-05	Respiratory	--	2	--	2
			Arsenic	--	- -	--	--	- -	NA	--	--	--	--
			Chromium VI	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	1E-05	--	--	1E-05		- -	2	- -	2
		Exposure Point Total						1E-05					2
	Exposure Medium Total							1E-05					2
Medium Total								8E-05					5
Receptor Total							Receptor Risk Total	4E-04				Receptor HI Total	6

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI	0.6
Total CVS HI	2
Total GS HI	0.07
Total Respiratory HI	3
Total None Reported HI	0.1
Total Skin HI	2
Total NA HI	0.002

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	1E-05	--	7E-06	--	2E-05	NA	--	--	--	--
			Arsenic	7E-06	--	8E-07	--	8E-06	Skin, CVS	0.05	--	0.005	0.05
			Chromium VI	7E-06	--	--	--	7E-06	None Reported	0.007	--	--	0.007
			Copper	--	--	--	--	--	GS	0.007	--	--	0.007
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	3E-05	--	7E-06	--	3E-05		0.06	--	0.005	0.07
		Exposure Point Total						3E-05					0.07
	Exposure Medium Total							3E-05					0.07
	Air	Atwater	Benzo(a)pyrene Equivalents	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Arsenic	--	1E-08	--	--	1E-08	NA	--	0.0007	--	0.0007
			Chromium VI	--	8E-07	--	--	8E-07	NA	--	0.0002	--	0.0002
			Copper	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	9E-07	--	--	9E-07		--	0.0008	--	0.0008
		Exposure Point Total						9E-07					0.0008
	Exposure Medium Total							9E-07					0.0008
Medium Total								3E-05					0.07
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	1E-05	--	5E-06	--	2E-05	NA	--	--	--	--
			Arsenic	7E-06	--	9E-07	--	8E-06	Skin, CVS	0.05	--	0.006	0.05
			Chromium VI	7E-06	--	--	--	7E-06	None Reported	0.007	--	--	0.007
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	2E-05	--	6E-06	--	3E-05		0.05	--	0.006	0.06
		Exposure Point Total						3E-05					0.06
	Exposure Medium Total							3E-05					0.06
	Air	Atwater	Benzo(a)pyrene Equivalents	--	1E-09	--	--	1E-09	NA	--	--	--	--
			Arsenic	--	2E-08	--	--	2E-08	NA	--	0.0007	--	0.0007
			Chromium VI	--	8E-07	--	--	8E-07	NA	--	0.0002	--	0.0002
			Lead	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	9E-07	--	--	9E-07		--	0.0009	--	0.0009
		Exposure Point Total						9E-07					0.0009
	Exposure Medium Total							9E-07					0.0009
Medium Total								3E-05					0.06

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY
PAGE 2 OF 2

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Atwater	2-Methylnaphthalene	- -	--	- -	--	- -	Respiratory	0.2	--	0.2	0.4
			Benzo(a)pyrene Equivalents	4E-06	--	- -	--	4E-06	NA	--	--	--	--
			Naphthalene	- -	--	- -	--	- -	Body Weight	0.2	--	0.1	0.3
			Arsenic	9E-05	--	5E-07	--	9E-05	Skin, CVS	0.6	--	0.003	0.6
			Chromium VI	3E-06	--	1E-06	--	4E-06	None Reported	0.003	--	0.001	0.005
			Chemical Total	9E-05	--	2E-06	--	1E-04		0.9	--	0.3	1
		Exposure Point Total						1E-04					1
	Exposure Medium Total							1E-04					1
	Air	Atwater	2-Methylnaphthalene	--	- -	--	--	- -	NA	--	--	--	--
			Benzo(a)pyrene Equivalents	--	- -	--	--	- -	NA	--	--	--	--
			Naphthalene	--	6E-05	--	--	6E-05	Respiratory	--	2	--	2
			Arsenic	--	- -	--	--	- -	NA	--	--	--	--
			Chromium VI	--	- -	--	--	- -	NA	--	--	--	--
			Chemical Total	--	6E-05	--	--	6E-05		- -	2	- -	2
		Exposure Point Total						6E-05					2
	Exposure Medium Total							6E-05					2
Medium Total								2E-04					3
Receptor Total							Receptor Risk Total	2E-04				Receptor HI Total	3

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

Total Body Weight HI	0.3
Total CVS HI	0.7
Total GS HI	0.007
Total Respiratory HI	2
Total None Reported HI	0.02
Total Skin HI	0.7
Total NA HI	0.002

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifelong

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Atwater	Benzo(a)pyrene Equivalents	1E-04	--	4E-05	--	1E-04					
			Arsenic	2E-05	--	2E-06	--	3E-05					
			Chromium VI	5E-05	--	- -	--	5E-05					
			Copper	- -	--	- -	--	- -					
			Lead	- -	--	- -	--	- -					
			Chemical Total	2E-04	--	4E-05	--	2E-04					
		Exposure Point Total						2E-04					
	Exposure Medium Total							2E-04					
	Air	Atwater	Benzo(a)pyrene Equivalents	--	2E-09	--	--	2E-09					
			Arsenic	--	2E-08	--	--	2E-08					
			Chromium VI	--	1E-06	--	--	1E-06					
			Copper	--	- -	--	--	- -					
			Lead	--	- -	--	--	- -					
			Chemical Total	--	1E-06	--	--	1E-06					
		Exposure Point Total						1E-06					
	Exposure Medium Total							1E-06					
Medium Total								2E-04					
Subsurface Soil	Subsurface Soil	Atwater	Benzo(a)pyrene Equivalents	8E-05	--	3E-05	--	1E-04					
			Arsenic	2E-05	--	2E-06	--	3E-05					
			Chromium VI	5E-05	--	- -	--	5E-05					
			Lead	- -	--	- -	--	- -					
			Chemical Total	2E-04	--	3E-05	--	2E-04					
		Exposure Point Total						2E-04					
	Exposure Medium Total							2E-04					
	Air	Atwater	Benzo(a)pyrene Equivalents	--	2E-09	--	--	2E-09					
			Arsenic	--	2E-08	--	--	2E-08					
			Chromium VI	--	1E-06	--	--	1E-06					
			Lead	--	- -	--	--	- -					
			Chemical Total	--	1E-06	--	--	1E-06					
		Exposure Point Total						1E-06					
	Exposure Medium Total							1E-06					
Medium Total								2E-04					

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
USCG ATWATER FACILITY

Scenario Timeframe: Future
Receptor Population: Residents
Receptor Age: Lifelong

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Atwater	2-Methylnaphthalene	- -	--	- -	--	- -					
			Benzo(a)pyrene Equivalents	1E-05	--	- -	--	1E-05					
			Naphthalene	- -	--	- -	--	- -					
			Arsenic	1E-04	--	8E-07	--	1E-04					
			Chromium VI	8E-06	--	4E-06	--	1E-05					
			Chemical Total	2E-04	--	5E-06	--	2E-04					
		Exposure Point Total						2E-04					
	Exposure Medium Total							2E-04					
	Air	Atwater	2-Methylnaphthalene	--	- -	--	--	- -					
			Benzo(a)pyrene Equivalents	--	- -	--	--	- -					
			Naphthalene	--	7E-05	--	--	7E-05					
			Arsenic	--	- -	--	--	- -					
			Chromium VI	--	- -	--	--	- -					
			Chemical Total	--	7E-05	--	--	7E-05					
		Exposure Point Total						7E-05					
	Exposure Medium Total							7E-05					
Medium Total								2E-04					
Receptor Total							Receptor Risk Total	6E-04					

Notes:
1 - Mutagenic chemicals were evaluated in accordance with USEPA's Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (2005).

ATTACHMENT 4

PROUCL PRINTOUTS

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	H:\USCG Atwater\UCLs\ProUCL Input file - SS.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	13
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	2.5	Minimum of Log Data	0.916
Maximum	19	Maximum of Log Data	2.944
Mean	8.096	Mean of log Data	2.005
Median	7.6	SD of log Data	0.439
SD	3.712		
Std. Error of Mean	0.992		
Coefficient of Variation	0.458		
Skewness	1.945		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.806	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.853	95% H-UCL	10.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.35
95% Adjusted-CLT UCL (Chen-1995)	10.28	97.5% Chebyshev (MVUE) UCL	14.19
95% Modified-t UCL (Johnson-1978)	9.939	99% Chebyshev (MVUE) UCL	17.79

Arsenic (continued)

Gamma Distribution Test	
k star (bias corrected)	4.699
Theta Star	1.723
MLE of Mean	8.096
MLE of Standard Deviation	3.735
nu star	131.6
Approximate Chi Square Value (.05)	106.1
Adjusted Level of Significance	0.0312
Adjusted Chi Square Value	103
Anderson-Darling Test Statistic	0.648
Anderson-Darling 5% Critical Value	0.737
Kolmogorov-Smirnov Test Statistic	0.197
Kolmogorov-Smirnov 5% Critical Value	0.229
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
95% Approximate Gamma UCL	10.04
95% Adjusted Gamma UCL	10.34
Potential UCL to Use	

Data Distribution	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
95% CLT UCL	9.728
95% Jackknife UCL	9.853
95% Standard Bootstrap UCL	9.69
95% Bootstrap-t UCL	10.95
95% Hall's Bootstrap UCL	19.08
95% Percentile Bootstrap UCL	9.861
95% BCA Bootstrap UCL	10.33
95% Chebyshev(Mean, Sd) UCL	12.42
97.5% Chebyshev(Mean, Sd) UCL	14.29
99% Chebyshev(Mean, Sd) UCL	17.97
Use 95% Approximate Gamma UCL	10.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	10
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	20	Maximum of Log Data	2.996
Mean	14.54	Mean of log Data	2.661
Median	14.5	SD of log Data	0.186
SD	2.678		
Std. Error of Mean	0.716		
Coefficient of Variation	0.184		
Skewness	0.325		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.981	Shapiro Wilk Test Statistic	0.985
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15.8	95% H-UCL	15.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.7
95% Adjusted-CLT UCL (Chen-1995)	15.78	97.5% Chebyshev (MVUE) UCL	19.07
95% Modified-t UCL (Johnson-1978)	15.81	99% Chebyshev (MVUE) UCL	21.75

Chromium (continued)

Gamma Distribution Test	
k star (bias corrected)	24.93
Theta Star	0.583
MLE of Mean	14.54
MLE of Standard Deviation	2.911
nu star	697.9
Approximate Chi Square Value (.05)	637.6
Adjusted Level of Significance	0.0312
Adjusted Chi Square Value	630
Anderson-Darling Test Statistic	0.163
Anderson-Darling 5% Critical Value	0.734
Kolmogorov-Smirnov Test Statistic	0.121
Kolmogorov-Smirnov 5% Critical Value	0.228
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
95% Approximate Gamma UCL	15.91
95% Adjusted Gamma UCL	16.1
Potential UCL to Use	

Data Distribution	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
95% CLT UCL	15.71
95% Jackknife UCL	15.8
95% Standard Bootstrap UCL	15.67
95% Bootstrap-t UCL	15.9
95% Hall's Bootstrap UCL	16.03
95% Percentile Bootstrap UCL	15.71
95% BCA Bootstrap UCL	15.75
95% Chebyshev(Mean, Sd) UCL	17.66
97.5% Chebyshev(Mean, Sd) UCL	19.01
99% Chebyshev(Mean, Sd) UCL	21.66
Use 95% Student's-t UCL	15.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	13
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	8.7	Minimum of Log Data	2.163
Maximum	620	Maximum of Log Data	6.43
Mean	116.4	Mean of log Data	4.082
Median	73	SD of log Data	1.226
SD	159.9		
Std. Error of Mean	42.73		
Coefficient of Variation	1.373		
Skewness	2.721		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	192.1	95% H-UCL	371.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	298.9
95% Adjusted-CLT UCL (Chen-1995)	219.9	97.5% Chebyshev (MVUE) UCL	378.2
95% Modified-t UCL (Johnson-1978)	197.3	99% Chebyshev (MVUE) UCL	533.9

Copper (continued)

Gamma Distribution Test	
k star (bias corrected)	0.731
Theta Star	159.4
MLE of Mean	116.4
MLE of Standard Deviation	136.2
nu star	20.46
Approximate Chi Square Value (.05)	11.19
Adjusted Level of Significance	0.0312
Adjusted Chi Square Value	10.29
Anderson-Darling Test Statistic	0.392
Anderson-Darling 5% Critical Value	0.766
Kolmogorov-Smirnov Test Statistic	0.133
Kolmogorov-Smirnov 5% Critical Value	0.236
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
95% Approximate Gamma UCL	212.9
95% Adjusted Gamma UCL	231.5
Potential UCL to Use	

Data Distribution	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
95% CLT UCL	186.7
95% Jackknife UCL	192.1
95% Standard Bootstrap UCL	187.1
95% Bootstrap-t UCL	283.7
95% Hall's Bootstrap UCL	446.3
95% Percentile Bootstrap UCL	190.2
95% BCA Bootstrap UCL	213.8
95% Chebyshev(Mean, Sd) UCL	302.7
97.5% Chebyshev(Mean, Sd) UCL	383.3
99% Chebyshev(Mean, Sd) UCL	541.6
Use 95% Approximate Gamma UCL	212.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	14
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	11	Minimum of Log Data	2.398
Maximum	970	Maximum of Log Data	6.877
Mean	267.4	Mean of log Data	4.989
Median	240	SD of log Data	1.31
SD	260.9		
Std. Error of Mean	69.74		
Coefficient of Variation	0.976		
Skewness	1.503		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.842	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	390.9	95% H-UCL	1162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	847.2
95% Adjusted-CLT UCL (Chen-1995)	412	97.5% Chebyshev (MVUE) UCL	1078
95% Modified-t UCL (Johnson-1978)	395.5	99% Chebyshev (MVUE) UCL	1532

Lead (continued)			
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.807	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	331.2		
MLE of Mean	267.4		
MLE of Standard Deviation	297.6		
nu star	22.6		
Approximate Chi Square Value (.05)	12.79	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	382.1
Adjusted Chi Square Value	11.82	95% Jackknife UCL	390.9
		95% Standard Bootstrap UCL	381.4
Anderson-Darling Test Statistic	0.379	95% Bootstrap-t UCL	446.2
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	485.4
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	382.9
Kolmogorov-Smirnov 5% Critical Value	0.235	95% BCA Bootstrap UCL	412.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	571.3
		97.5% Chebyshev(Mean, Sd) UCL	702.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	961.3
95% Approximate Gamma UCL	472.4		
95% Adjusted Gamma UCL	511.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	472.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

BAP Equivalents

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14
Number of Missing Values	9		

Raw Statistics		Log-transformed Statistics	
Minimum	0.101	Minimum of Log Data	-2.29
Maximum	4.212	Maximum of Log Data	1.438
Mean	1.141	Mean of log Data	-0.428
Median	0.603	SD of log Data	1.14
SD	1.246		
Std. Error of Mean	0.333		
Coefficient of Variation	1.092		
Skewness	1.608		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.786	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.73	95% H-UCL	3.256
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.871
95% Adjusted-CLT UCL (Chen-1995)	1.841	97.5% Chebyshev (MVUE) UCL	3.608
95% Modified-t UCL (Johnson-1978)	1.754	99% Chebyshev (MVUE) UCL	5.057

BAP Equivalents (continued)

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.856	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.333		
MLE of Mean	1.141		
MLE of Standard Deviation	1.233		
nu star	23.96		
Approximate Chi Square Value (.05)	13.82	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.688
Adjusted Chi Square Value	12.8	95% Jackknife UCL	1.73
		95% Standard Bootstrap UCL	1.669
Anderson-Darling Test Statistic	0.355	95% Bootstrap-t UCL	2.147
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	2.752
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	1.715
Kolmogorov-Smirnov 5% Critical Value	0.235	95% BCA Bootstrap UCL	1.833
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.592
		97.5% Chebyshev(Mean, Sd) UCL	3.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.454
95% Approximate Gamma UCL	1.978		
95% Adjusted Gamma UCL	2.134		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1.978

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	H:\USCG Atwater\UCLs\ProUCL Input file - SB.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	12
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	3.3	Minimum of Log Data	1.194
Maximum	17	Maximum of Log Data	2.833
Mean	8.193	Mean of log Data	2.002
Median	7.25	SD of log Data	0.46
SD	4.063		
Std. Error of Mean	1.086		
Coefficient of Variation	0.496		
Skewness	1.262		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.12	95% H-UCL	10.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.63
95% Adjusted-CLT UCL (Chen-1995)	10.37	97.5% Chebyshev (MVUE) UCL	14.57
95% Modified-t UCL (Johnson-1978)	10.18	99% Chebyshev (MVUE) UCL	18.37

Arsenic (continued)			
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.042	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	2.027		
MLE of Mean	8.193		
MLE of Standard Deviation	4.075		
nu star	113.2		
Approximate Chi Square Value (.05)	89.61	***Nonparametric Statistics***	
Adjusted Level of Significance	0.0312	95% CLT UCL	9.979
Adjusted Chi Square Value	86.83	95% Jackknife UCL	10.12
		95% Standard Bootstrap UCL	9.919
Anderson-Darling Test Statistic	0.356	95% Bootstrap-t UCL	11.23
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	11.68
Kolmogorov-Smirnov Test Statistic	0.15	95% Percentile Bootstrap UCL	9.971
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	10.26
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.93
		97.5% Chebyshev(Mean, Sd) UCL	14.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19
95% Approximate Gamma UCL	10.35		
95% Adjusted Gamma UCL	10.68		
Potential UCL to Use		Use 95% Approximate Gamma UCL	10.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	9
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	19	Maximum of Log Data	2.944
Mean	14.79	Mean of log Data	2.681
Median	14.5	SD of log Data	0.17
SD	2.424		
Std. Error of Mean	0.648		
Coefficient of Variation	0.164		
Skewness	-0.125		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.982	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15.93	95% H-UCL	16.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.73
95% Adjusted-CLT UCL (Chen-1995)	15.83	97.5% Chebyshev (MVUE) UCL	19.01
95% Modified-t UCL (Johnson-1978)	15.93	99% Chebyshev (MVUE) UCL	21.51

Chromium (continued)			
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	30.26	Data appear Normal at 5% Significance Level	
Theta Star	0.489		
MLE of Mean	14.79		
MLE of Standard Deviation	2.688		
nu star	847.2		
Approximate Chi Square Value (.05)	780.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	15.85
Adjusted Chi Square Value	772.1	95% Jackknife UCL	15.93
		95% Standard Bootstrap UCL	15.83
Anderson-Darling Test Statistic	0.216	95% Bootstrap-t UCL	15.87
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	15.87
Kolmogorov-Smirnov Test Statistic	0.137	95% Percentile Bootstrap UCL	15.79
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	15.71
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.61
		97.5% Chebyshev(Mean, Sd) UCL	18.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.23
95% Approximate Gamma UCL	16.05		
95% Adjusted Gamma UCL	16.22		
Potential UCL to Use		Use 95% Student's-t UCL	15.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Note: For highly negative-skewed data, confidence limits
(e.g., Chen, Johnson, Lognormal, and Gamma) may not be
reliable. Chen's and Johnson's methods provide
adjustments for positvely skewed data sets.

Lead

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	13
Number of Missing Values	8		

Raw Statistics		Log-transformed Statistics	
Minimum	8.5	Minimum of Log Data	2.14
Maximum	2400	Maximum of Log Data	7.783
Mean	299.8	Mean of log Data	4.448
Median	112	SD of log Data	1.616
SD	633.3		
Std. Error of Mean	169.3		
Coefficient of Variation	2.112		
Skewness	3.256		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.483	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	599.6	95% H-UCL	1822
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	827.8
95% Adjusted-CLT UCL (Chen-1995)	735.6	97.5% Chebyshev (MVUE) UCL	1072
95% Modified-t UCL (Johnson-1978)	624.1	99% Chebyshev (MVUE) UCL	1550

Lead (continued)

Gamma Distribution Test	
k star (bias corrected)	0.445
Theta Star	674.2
MLE of Mean	299.8
MLE of Standard Deviation	449.6
nu star	12.45
Approximate Chi Square Value (.05)	5.526
Adjusted Level of Significance	0.0312
Adjusted Chi Square Value	4.926
Anderson-Darling Test Statistic	0.998
Anderson-Darling 5% Critical Value	0.793
Kolmogorov-Smirnov Test Statistic	0.297
Kolmogorov-Smirnov 5% Critical Value	0.242
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
95% Approximate Gamma UCL	675.6
95% Adjusted Gamma UCL	757.8
Potential UCL to Use	

Data Distribution	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
95% CLT UCL	578.2
95% Jackknife UCL	599.6
95% Standard Bootstrap UCL	572.6
95% Bootstrap-t UCL	2569
95% Hall's Bootstrap UCL	2197
95% Percentile Bootstrap UCL	617.4
95% BCA Bootstrap UCL	789.1
95% Chebyshev(Mean, Sd) UCL	1038
97.5% Chebyshev(Mean, Sd) UCL	1357
99% Chebyshev(Mean, Sd) UCL	1984
Use 99% Chebyshev (Mean, Sd) UCL	1984

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

BAP Equivalents

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14
Number of Missing Values	9		

Raw Statistics		Log-transformed Statistics	
Minimum	0.0275	Minimum of Log Data	-3.592
Maximum	3.307	Maximum of Log Data	1.196
Mean	0.778	Mean of log Data	-1.234
Median	0.434	SD of log Data	1.677
SD	0.998		
Std. Error of Mean	0.267		
Coefficient of Variation	1.282		
Skewness	1.715		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.765	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.251	95% H-UCL	7.762
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.141
95% Adjusted-CLT UCL (Chen-1995)	1.348	97.5% Chebyshev (MVUE) UCL	4.077
95% Modified-t UCL (Johnson-1978)	1.271	99% Chebyshev (MVUE) UCL	5.915

BAP Equivalents (continued)

Gamma Distribution Test	
k star (bias corrected)	0.538
Theta Star	1.446
MLE of Mean	0.778
MLE of Standard Deviation	1.061
nu star	15.07
Approximate Chi Square Value (.05)	7.311
Adjusted Level of Significance	0.0312
Adjusted Chi Square Value	6.605
Anderson-Darling Test Statistic	0.353
Anderson-Darling 5% Critical Value	0.782
Kolmogorov-Smirnov Test Statistic	0.158
Kolmogorov-Smirnov 5% Critical Value	0.24
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
95% Approximate Gamma UCL	1.605
95% Adjusted Gamma UCL	1.776
Potential UCL to Use	

Data Distribution	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
95% CLT UCL	1.217
95% Jackknife UCL	1.251
95% Standard Bootstrap UCL	1.197
95% Bootstrap-t UCL	1.717
95% Hall's Bootstrap UCL	1.728
95% Percentile Bootstrap UCL	1.237
95% BCA Bootstrap UCL	1.364
95% Chebyshev(Mean, Sd) UCL	1.941
97.5% Chebyshev(Mean, Sd) UCL	2.444
99% Chebyshev(Mean, Sd) UCL	3.431
Use 95% Approximate Gamma UCL	1.605

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

ATTACHMENT 5

SAMPLE CALCULATIONS

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of surface soil at USCG Atwater.

EQUATION:

$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
IR	=	incidental ingestion rate (mg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
FI	=	fraction ingested from contaminated source (unitless)
CF	=	conversion factor (1.0E-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDo	=	oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cs	=	10	mg/kg	Chemical: Arsenic
IR	=	330	mg/day	
EF	=	250	days/year	
ED	=	1	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	365	days	
CSFo	=	1.5E+00	$(mg/kg/day)^{-1}$	
RfDo	=	3.0E-04	(mg/kg/day)	

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{10\ mg/kg \times 330\ mg/day \times 250\ days/year \times 1\ years \times 1 \times 1.0E\text{-}06\ kg/mg}{70\ kg \times 25550\ days}$$

IEXc = 4.61E-07 mg/kg/day

ILCR = 4.61E-07 mg/kg/day x 1.50E+00 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 6.9E-07

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{10\ mg/kg \times 330\ mg/day \times 250\ days/year \times 1\ years \times 1 \times 1.0E\text{-}06\ kg/mg}{70\ kg \times 365\ days}$$

IEXnc = 3.23E-05 mg/kg/day

HQ = 3.23E-05 mg/kg/day / 3.00E-04 (mg/kg/day) = Hazard Quotient

HQ = 1.1E-01

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with surface soil at USCG Atwater.

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

DEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
CF	=	conversion factor (1.0E-6 kg/mg)
SA	=	skin surface available for contact (cm^2/day)
ABS	=	absorption factor (unitless)
AF	=	adherence factor (mg/cm^2)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDd	=	dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDd (mg/kg/day)

ASSUMPTIONS:

Cs	=	10	mg/kg	Chemical: Arsenic
CF	=	1.0E-06	kg/mg	
SA	=	3300	cm^2/day	
AF	=	0.3	mg/cm^2	
ABS	=	0.03		
EF	=	250	days/year	
ED	=	1	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	365	days	
CSFd	=	1.5E+00	$(mg/kg/day)^{-1}$	
RfDd	=	3.0E-04	(mg/kg/day)	

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL CONSTRUCTION WORKERS		
BASED ON: USEPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{10\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 3300\ cm2/day \times 0.3\ mg/cm2 \times 0.03 \times 250\ days/year \times 1\ years}{70\ kg \times 25550\ days}$$

DEXc = 4.15E-08 mg/kg/day

ILCR = 4.15E-08 mg/kg/day x 1.50E+00 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 6.2E-08

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{10\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 3300\ cm2/day \times 0.3\ mg/cm2 \times 0.03 \times 250\ days/year \times 1\ years}{70\ kg \times 365\ days}$$

DEXnc = 2.91E-06 mg/kg/day

HQ = 2.91E-06 mg/kg/day / 3.00E-04 (mg/kg/day) = Hazard Quotient

HQ = 9.7E-03

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: ESTIMATION OF AMBIENT AIR CONCENTRATIONS RESULTING FROM FUGITIVE DUST EMISSIONS AND VOLATILIZATION FROM SOIL FOR CONSTRUCTION WORKERS		
BASED ON: U.S. EPA 2002		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To calculate ambient air concentrations resulting from fugitive dust from soil.

RELEVANT EQUATIONS:

Cair = Cs x (1/PEF)

Where:

Cair = Chemical concentration in air (mg/m^3)
Cs = Chemical concentration in soil (mg/kg)
PEF = Particulate emission factor (m^3/kg)

ASSUMPTIONS:

Cs = 15.8 mg/kg Chemical: Chromium VI
PEF = 1.43E+06 m3/kg

EXAMPLE CALCULATIONS

Cair = 15.8 mg/kg x [(1/1.43E+06 m3/kg)]

Cair = 1.10E-05 mg/m^3

CLIENT:	JOB NUMBER:
USCG ATWATER, DETROIT, MICHIGAN	112G02435
SUBJECT: CALCULATION OF PARTICUALATE EMISSION FACTOR FOR CONSTRUCTION WORKERS	
BASED ON: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, December 2002)	

BY:	CHECKED BY:	DATE:
L. CIOFANI		08/17/11

Equation 5-5
Derivation of the Particulate Emission Factor
Construction Scenario - Construction Worker

$$PEF_{sc} = Q/C_{sr} \times \frac{1}{F_D} \times \left[\frac{T \times A_R}{556 \times (W/3)^{0.4} \times \frac{(365d/yr - p)}{365d/yr} \times \Sigma VKT} \right]$$

Parameter/Definition (units)	Default
PEF_{sc}/subchronic road particulate emission factor (m^3/kg)	site-specific
Q/C_{sr}/ inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m^2-s per kg/m^3)	23.02[a] (Equation 5-6)
F_D/dispersion correction factor (unitless)	0.185 (Appendix E)
T/total time over which construction occurs (s)	site-specific
A_R/surface area of contaminated road segment (m^2) L_R/length of road segment (ft) W_R/width of road segment (ft)	274.213 ($A_R = L_R \times W_R \times 0.092903 m^2/ft^2$)
W/mean vehicle weight (tons)	site-specific
p/number of days with at least 0.01 inches of precipitation (days/year)	site-specific (Exhibit 5-2)
ΣVKT/sum of fleet vehicle kilometers traveled during the exposure duration (km)	site-specific

[a] Assumes a 0.5 acre site

Calculation of PEF for Construction Workers

Q/C	23.02	(g/m^2-s per kg/m^3)	
Fd	0.185	dispersion correction factor (unitless)	
T	7.20E+06	sec	3600 sec/hr x 8hr/day x 250 days/yr
Area (A)	274.213	m^2	
W	8	tons	
p	140	day/year	
VKT	337.5	km	30 vehicles x 0.045 km/day x 250 days

PEF = 1.43E+06 m^3/kg

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS CONSTRUCTION WORKERS		
BASED ON: USEPA, JANUARY 2009		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and non-carcinogenic risks from inhalation of surface soil at USCG Atwater.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT \times 24\ hours/day}$$

Where:

EC	=	exposure concentration (mg/m3)
Ca	=	exposure point concentration in air (mg/m3)
Cs	=	exposure point concentration in soil (mg/kg)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
IURi	=	inhalation unit risk ($(ug/m3)^{-1}$)
RfCi	=	inhalation reference concentration (mg/m3)

RISKS:

ILCR (Carcinogens) = Exposure Concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg
HQ (Noncarcinogens) = Exposure Concentration (mg/m3) / RFCi (mg/m3)

ASSUMPTIONS:

Cs	=	15.8 mg/kg	Chemical: Chromium VI
Ca	=	1.10E-05 mg/m3	
ET	=	8 hours	
EF	=	250 days/year	
ED	=	1 years	
ATc	=	25550 days	
ATnc	=	365 days	
IURi	=	8.4E-02 $(ug/m3)^{-1}$	
RfCi	=	1.0E-04 (mg/m3)	

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS CONSTRUCTION WORKERS		
BASED ON: USEPA, JANUARY 2009		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{1.10E\text{-}05 \text{ mg/m3} \times 8 \text{ hours} \times 250 \text{ days/year} \times 1 \text{ years}}{25550 \text{ days} \times 24 \text{ hours/day}}$$

IEXc = 3.59E-08 mg/m3

ILCR = 3.59E-08 mg/m3 x 8.40E-02 (ug/m3)-1 x 1000 ug/mg = Incremental Lifetime Cancer Risk

ILCR = 3.0E-06

EXAMPLE NON-CARCINOGENIC CALCULATION

$$IEXnc = \frac{1.10E\text{-}05 \text{ mg/m3} \times 8 \text{ hours} \times 250 \text{ days/year} \times 1 \text{ years}}{365 \text{ days} \times 24 \text{ hours/day}}$$

IEXnc = 2.51E-06 mg/m3

HQ = 2.51E-06 mg/m3 / 1.00E-04 (mg/m3) = Hazard Quotient

HQ **2.8E-07**

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from ingestion of groundwater at USCG Atwater.

EQUATION:

$$IEX = \frac{Cgw \times CF \times IF \times EF \times ED}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cgw	=	exposure point concentration in groundwater (ug/L)
CF	=	conversion factor (1.0E-3 mg/ug)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDo	=	oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cgw	=	6.2	ug/L	Chemical: Arsenic
IR	=	2	L/day	
CF	=	1.0E-03	mg/ug	
EF	=	350	days/year	
ED	=	24	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	8760	days	
CSFo	=	1.5E+00	$(mg/kg/day)^{-1}$	
RfDo	=	3.0E-04	(mg/kg/day)	

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{6.2\ ug/L \times 0.001\ mg/ug \times 2\ L/day \times 350\ days/year \times 24\ years}{70\ kg \times 25550\ days}$$

IEXc = 5.82E-05 mg/kg/day

ILCR = 5.82E-05 mg/kg/day x 1.50E+00 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = 8.7E-05

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{6.2\ ug/L \times 0.001\ mg/ug \times 2\ L/day \times 350\ days/year \times 24\ years}{70\ kg \times 8760\ days}$$

IEXnc = 1.70E-04 mg/kg/day

$$HQ = \frac{1.70E\text{-}04\ mg/kg/day}{3.00E\text{-}04\ (mg/kg/day)} = \text{Hazard Quotient}$$

HQ = 5.7E-01

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with groundwater at USCG Atwater.

EQUATION:

$$DAD = \frac{DAevent \times EV \times ED \times EF \times A}{BW \times AT}$$

Where:

DAD	=	dermally absorbed dose (mg/kg/day)
DAevent	=	absorbed dose per event (mg/cm^2/event)
EV	=	event frequency (events/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
A	=	skin surface available for contact (cm^2)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFd	=	dermal carcinogenic slope factor ((mg/kg/day)$^{-1}$)
RfDd	=	dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = DAD (mg/kg/day) x CSFd (mg/kg/day)-1
HQ (Noncarcinogens) = DAD (mg/kg/day) / RFDd (mg/kg/day)

EQUATIONS for DAevent:

For Inorganics:

DAevent = Kp x Cw x CF x tevent

For Organics:

$$\text{If } tevent \le t^*, \text{ then: } DAevent = 2 \times FA \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times tevent}{\pi}}$$

$$\text{If } tevent > t^*, \text{ then: } DAevent = FA \times Kp \times Cw \times CF \times \left[\frac{tevent}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$$

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		JOB NUMBER: 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 08/17/11

Where:

Kp	=	permeability coefficient from water (cm/hr)
Cgw	=	concentration of chemical in groundwater (mg/L)
tevent	=	duration of event (hr/event)
CF	=	conversion factor (0.001 L/cm^3)
t*	=	time it takes to reach steady-state (hr/event)
τ	=	lag time (hr/event)
B	=	Bunge Model Constant (dimensionless)

EXAMPLE CALCULATION OF DAevent

ASSUMPTIONS:

Cgw	=	0.12	mg/L	Chemical: Naphthalene
Kp	=	4.66E-02	cm/hr	
FA	=	1	unitless	
tevent	=	0.58	hr/event	
CF	=	0.001	L/cm^3	
t*	=	1.34E+00	hr/event	
τ	=	5.58E-01	hr/event	
B	=	2.03E-01		

tevent < t*, therefore,

$$DAevent = (2 \times 0.0466\ cm/hr)\ (1)\ (0.12\ mg/L)\ (0.001\ L/cm3) \times \sqrt{\frac{6 \times 0.558\ hr/event \times 0.58\ hr/event}{\pi}}$$

DAevent = 8.79E-06 mg/cm^2-event

RISK CALCULATIONS

ASSUMPTIONS:

A	=	18000	cm^2/day
EV	=	1	event/day
ED	=	24	years
EF	=	350	days/year
BW	=	70	kg
ATc	=	25550	days
ATnc	=	8760	days
CSFd	=	NA	$(mg/kg/day)^{-1}$
RfDd	=	2.0E-02	(mg/kg/day)

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		JOB NUMBER: 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, JULY 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$DADc = \frac{1.02E\text{-}05 \text{ mg/cm2-event} \times 1 \text{ event/day} \times 24 \text{ years} \times 350 \text{ days/year} \times 18000 \text{ cm2/day}}{70 \text{ kg} \times 25550 \text{ days}}$$

DADc = 7.43E-04 mg/kg/day

DADc = 7.43E-04 mg/kg/day x NA (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ILCR = No CSFd is available for naphthalene.

EXAMPLE NONCARCINOGENIC CALCULATION

$$DADnc = \frac{1.02E\text{-}05 \text{ mg/cm2-event} \times 1 \text{ event/day} \times 24 \text{ years} \times 350 \text{ days/year} \times 18000 \text{ cm2/day}}{70 \text{ kg} \times 8760 \text{ days}}$$

DADnc = 2.51E-03 mg/kg/day

HQ = 2.51E-03 mg/kg/day / 2.00E-02 (mg/kg/day) = Hazard Quotient

HQ = 1.3E-01

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: ESTIMATION OF AMBIENT AIR CONCENTRATIONS IN A TRENCH RESULTING FROM VOLATILE EMISSIONS FROM GROUNDWATER		
BASED ON: VDEQ, 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To calculate ambient air concentrations resulting from volatilization of chemicals from groundwater at USCG Atwater.

Ctrench = CGW x VF

Where:

Ctrench = concentration of contaminant in the trench µg/m^3
CGW = concentration of contaminant in groundwater µg/L
VF = volatilization factor L/m^3

1. Calculate kiG (gas-phase mass transfer coefficient of component i)

$kiG = (MWH2O/MWi)^{0.335} \times (T/298)^{1.005} \times kG, H2O$

Where:

kiG = gas-phase mass transfer coefficient of component i cm/s
MW_{H2O} = molecular weight of water = 18 g/mol
MW_{naph} = molecular weight of Naphthalene = 128 g/mol
kG,H_2O = gas-phase mass transfer coefficient of water vapor at 25°C cm/s = 0.833 cm/s
T = average system absolute temperature = 298
The value of kG, H_2O is 0.833 cm/s (Superfund Exposure Assessment Manual, U. S. EPA, April 1988)

$kiG = (18/128)^{0.335} \times (298/298)^{1.005} \times 0.833$ cm/s = 4.32E-01 cm/s

2. Calculate kiL (liquid-phase mass transfer coefficient of component i)

$kiL = (MWO_2/MWi)^{0.5} \times (T/298) \times kL, O_2$

Where:
kiL = liquid-phase mass transfer coefficient of component i cm/s
MW_{O2} = molecular weight of O_2 = 32 g/mol
MW_{naph} = molecular weight of Naphthalene = 128 g/mol
T = average system absolute temperature = 298
kL, O_2 = liquid-phase mass transfer coefficient of oxygen at 25°C cm/s = 0.002 cm/s

$kiL = (32/128)^{0.5} \times (298/298) \times 0.002$ cm/s = 1.00E-03 cm/s

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		JOB NUMBER: 112G02435
SUBJECT: ESTIMATION OF AMBIENT AIR CONCENTRATIONS IN A TRENCH RESULTING FROM VOLATILE EMISSIONS FROM GROUNDWATER		
BASED ON: VDEQ, 2004		
BY: L. CIOFANI	CHECKED BY:	DATE: 08/17/11

3. Calculate Ki (overall mass transfer coefficient of contaminant)

$Ki = 1 / \{(1/kiL) + [(RT) / (Hi \times kiG)]\}$

Where:

kiL = liquid-phase mass transfer coefficient of i cm/s =	1.00E-03
R = ideal gas constant atm-m^3/mole-°K =	8.20E-05
T = average system absolute temperature =	298
Hi = Henry's Law constant of naph (atm-m^3/mol) =	4.40E-04
KiG = gas-phase mass transfer coefficient of i cm/s	4.32E-01

$Ki = 1 / \{(1/1.0E\text{-}3) + [(298 \times 8.2E\text{-}5) / (4.40E\text{-}4 \times 0.432)]\}$ = 8.86E-04 cm/s

4. Calculation of VF (Volatilization Factor)

$VF = (Ki \times A \times F \times 10^{-3} \times 10^{4} \times 3{,}600) / (ACH \times V)$

Where:

VF = volatilization factor (L/m^3)		
Ki = overall mass transfer coefficient of contaminant =		8.86E-04 cm/s
A = area of the trench =		8.18 m^2
F = fraction of floor through which contaminant can enter (unitless) =		1
ACH = air changes per hour =		360 h^{-1}
V = volume of trench =		24.92 m^3
10^{-3} = conversion factor L/cm^3	0.001	
10^{4} = conversion factor cm^2/m^2	10000	
3,600 = conversion factor seconds/hr	3600	

$VF = (8.86E\text{-}4 \times 8.18 \times 1 \times 10^{-3} \times 10^{4} \times 3{,}600) / (360 \times 24.92)$ = 2.91E-02 L/m^3

5. Calculation of C_{trench} (concentration of contaminant in the trench)

$C_{trench} = C_{GW} \times VF$

Where:

C_{trench} = concentration of contaminant in the trench ($\mu g/m^3$)		
C_{GW} = concentration of naphthalene in groundwater =	120	µg/L
VF = volatilization factor =	2.91E-02	L/m^3

C_{trench} = 120 µg/L x 2.91E-02 L/m3 = **3.49E+00 $\mu g/m^3$**

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILES FROM GROUNDWATER - CONSTRUCTION WORKERS		
BASED ON: USEPA, JANUARY 2009		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from inhalation of volatiles from groundwater at USCG Atwater.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT \times 24\ hours/day}$$

Where:

EC	=	exposure concentration (mg/m3)
Ca	=	exposure point concentration in air (mg/m3)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (days)
IURi	=	inhalation unit risk $((ug/m3)^{-1})$
RfCi	=	inhalation reference concentration (mg/m3)

RISKS:

ILCR (Carcinogens) = Exposure Concentratin (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg
HQ (Noncarcinogens) = Exposure Concentration (mg/m3) / RFCi (mg/m3)

ASSUMPTIONS:

Ca	=	3.49E-03	mg/m3	Chemical: Naphthalene
ET	=	4	hr/day	
EF	=	90	days/year	
ED	=	1	years	
ATc	=	25550	days	
ATnc	=	365	days	
IURi	=	3.4E-05	$(ug/m^3)^{-1}$	
RfCi	=	3.0E-03	mg/m^3	

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILES FROM GROUNDWATER - CONSTRUCTION WORKERS		
BASED ON: USEPA, JANUARY 2009		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$ECc = \frac{3.49E\text{-}03 \text{ mg/m3} \times 4 \text{ hr/day} \times 90 \text{ days/year} \times 1 \text{ years}}{25550 \text{ days} \times 24 \text{ hours/day}}$$

ECc = 2.05E-06 mg/m3

ILCR = 2.05E-06 mg/m3 x 3.40E-05 (ug/m3)-1 x 1000 ug/mg = Incremental Lifetime Cancer Risk

ILCR = 7.0E-08

EXAMPLE NONCARCINOGENIC CALCULATION

$$ECnc = \frac{3.49E\text{-}03 \text{ mg/m3} \times 4 \text{ hr/day} \times 90 \text{ days/year} \times 1 \text{ years}}{365 \text{ days} \times 24 \text{ hours/day}}$$

ECnc = 1.43E-04 mg/m3

HQ = 1.43E-04 mg/m3 / 3.00E-03 mg/m3 = Hazard Quotient

HQ **4.8E-02**

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILES WHILE SHOWERING BY AN ADULT RESIDENT		
BASED ON: EPA, 1989 AND FOSTER AND CHROSTOWSKI, 1987		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from inhalation of volatiles while showering by an adult resident USCG Atwater.

EQUATIONS:

$$EC = \frac{S \times K \times EF \times ED}{AT \times Ra \times CF}$$

Where:

$$K = Ds + \frac{\exp(-Ra \times Dt) - \exp[Ra \times (Ds - Dt)]}{Ra}$$

$S = Cwd \times FR/SV$ $\quad Cwd = Cw \times [1-\exp(-Kal \times ts/60d)]$

$Kal = Kl \times [(T1 \times Us)/(Ts \times U1)^{-0.5}$ $\quad Kl = 1/[1/k1 + RT/(H \times kg)]$

$k1 = 20\ cm/hr \times (44/MW)^{0.5}$ $\quad kg = 3000\ cm/hr \times (18/MW)^{0.5}$

RISKS:

ILCR (Carcinogens) = Exposure Concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg
HQ (Noncarcinogens) = Exposure Concentration (mg/m3) / RFCi (mg/m3)

Where:

EC	=	exposure concentration (mg/m3)
S	=	volatile chemical generation rate (mg/m3-min - shower)
EF	=	exposure frequency (showers/year)
ED	=	exposure duration (years)
AT	=	averaging time (days)
Ra	=	air exchange rate (1/min)
Ds	=	shower duration (min)
Dt	=	total time in bathroom (min)
FR	=	shower water flow rate (L/min)
SV	=	shower room air volume (m3)
CW	=	chemical concentration in groundwater (mg/L)
ts	=	shower droplet drop time (sec)
d	=	shower droplet diameter (mm)
MW	=	molecular weight of compound (g/mole)
H	=	Henry's Law constant (atm-m3/mole)
RT	=	Ideal gas constant x absolute temperature (2.4E-02 atm-m3/mole)
T1	=	calibration water temperature (K)
Ts	=	shower water temperature (K)
U1	=	water viscosity at T1 (cp)
Us	=	water viscosity at Ts (cp)
IURi	=	inhalation unit risk ($(ug/m3)^{-1}$)
RfCi	=	inhalation reference concentration (mg/m3)

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILES WHILE SHOWERING BY AN ADULT RESIDENT		
BASED ON: EPA, 1989 AND FOSTER AND CHROSTOWSKI, 1987		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

ASSUMPTIONS: Chemical: Naphthalene

EF	=	350	showers/year
ED	=	24	years
ATc	=	25550	days
ATn	=	8760	days
Ra	=	0.0167	1/min
CF	=	1440	min/day
Ds	=	30	min
Dt	=	60	min
FR	=	10	L/min
SV	=	12	m3
Cw	=	0.12	mg/L
ts	=	0.5	sec
d	=	1	mm
MW	=	128	g/mole
H	=	4.40E-04	atm-m3/mole
RT	=	2.40E-02	atm-m3/mole
T1	=	293	K
Ts	=	320	K
U1	=	1.002	centipoise
Us	=	0.596	centipoise
CSFi	=	3.40E-05	(ug/m3)-1
RfDi	=	3.00E-03	(mg/m3)

EXAMPLE CALCULATION:

k1 = 20 cm/hr x (44 g/mole / 128 g/mole)^0.5

k1 = **11.73 cm/hr**

kg = 3000 cm/hr x (18 g/mole / 128 g/mole)^0.5

kg = **1125.00 cm/hr**

Kl = 1/[1/11.7 cm/hr + 2.40E-02 atm-m3/mole/(4.40E-04 atm-m3/mole x 1125.0 cm/hr)]

Kl = **7.48E+00 cm/hr**

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		JOB NUMBER: 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILES WHILE SHOWERING BY AN ADULT RESIDENT		
BASED ON: EPA, 1989 AND FOSTER AND CHROSTOWSKI, 1987		
BY: L. CIOFANI	CHECKED BY:	DATE: 08/17/11

Kal = 7.48E+00 cm/hr x [(293 K x 0.596 centipoise)/(320 K x 1.002 centipoise)]^-0.5

Kal = **10.1 cm/hr**

Cwd = 0.12 mg/L x [1 - exp((-10.1 cm/hr x 0.5 sec)/(60 x 1 mm))]

Cwd = **9.71E-03 mg/L**

S = 9.71E-03 mg/L x 10 L/min / 12 m3

S = **8.10E-03 mg/m3-min-shower**

$$K = 30 \text{ min} + \frac{\exp(-0.0167 \text{ 1/min} \times 60 \text{ min}) - \exp[0.0167 \text{ 1/min} \times (30 \text{ min} - 60 \text{ min})]}{0.0167 \text{ 1/min}}$$

K = **15.70 min**

CARCINOGENIC INTAKE:

$$EC = \frac{8.10E\text{-}03 \text{ mg/m3-min-shower} \times 15.70 \text{ min} \times 350 \text{ showers/year} \times 24 \text{ years}}{25550 \text{ days} \times 0.0167 \text{ 1/min} \times 1440 \text{ min/day}}$$

EC = **1.74E-03 mg/m3**

Risk = 1.74E-03 mg/m3 x 3.40E-05 (ug/m3)-1 x 1000 ug/mg

Risk = **5.91E-05**

NONCARCINOGENIC INTAKE:

$$EC = \frac{8.10E\text{-}03 \text{ mg/m3-min-shower} \times 15.70 \text{ min} \times 350 \text{ showers/year} \times 24 \text{ years}}{8760 \text{ days} \times 0.0167 \text{ 1/min} \times 1440 \text{ min/day}}$$

EC = **5.07E-03 mg/m3**

HQ = 5.07E-03 mg/m3 / 3.00E-03 (mg/m3)

HQ = **1.69E+00**

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from incidental ingestion of surface soil at USCG Atwater.

EQUATION:

$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
IR	=	incidental ingestion rate (mg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
FI	=	fraction ingested from contaminated source (unitless)
CF	=	conversion factor (1.0E-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
IR	=	200	mg/day	
EF	=	350	days/year	
ED_1	=	2	years	
ED_2	=	4	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	15	kg	
AT	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	10		
$ADAF_2$	=	3		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEX_1 = \frac{2\ mg/kg \times 200\ mg/day \times 350\ days/year \times 2\ years \times 1 \times 1.0E\text{-}06\ kg/mg}{15\ kg \times 25550\ days} \times 10$$

IEX_1 = 7.31E-06 mg/kg/day

$$IEX_2 = \frac{2\ mg/kg \times 200\ mg/day \times 350\ days/year \times 4\ years \times 1 \times 1.0E\text{-}06\ kg/mg}{15\ kg \times 25550\ days} \times 3$$

IEX_2 = 4.38E-06 mg/kg/day

ILCR = (7.31E-06 mg/kg/day + 4.38E-06 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 8.5E-05

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from incidental ingestion of surface soil at USCG Atwater.

EQUATION:

$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
IR	=	incidental ingestion rate (mg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
FI	=	fraction ingested from contaminated source (unitless)
CF	=	conversion factor (1.0E-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
IR	=	100	mg/day	
EF	=	350	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	70	kg	
AT	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEX_1 = \frac{2 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/year} \times 10 \text{ years} \times 1 \times 1.0E\text{-}06 \text{ kg/mg}}{70 \text{ kg} \times 25550 \text{ days}} \times 3$$

IEX_1 = 1.17E-06 mg/kg/day

$$IEX_2 = \frac{2 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/year} \times 14 \text{ years} \times 1 \times 1.0E\text{-}06 \text{ kg/mg}}{70 \text{ kg} \times 25550 \text{ days}} \times 1$$

IEX_2 = 5.48E-07 mg/kg/day

ILCR = (1.17E-06 mg/kg/day + 5.48E-07 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 1.3E-05

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL CHILD RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from dermal contact with surface soil at USCG Atwater.

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT} \times ADAF$$

Where:

DEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
CF	=	conversion factor (1.0E-6 kg/mg)
SA	=	skin surface available for contact (cm^2/day)
ABS	=	absorption factor (unitless)
AF	=	adherence factor (mg/cm^2)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
CF	=	1.0E-06	kg/mg	
SA	=	2800	cm^2/day	
AF	=	0.2	mg/cm^2	
ABS	=	0.13		
EF	=	350	days/year	
ED_1	=	2	years	
ED_2	=	4	years	
BW	=	15	kg	
AT	=	25550	days	
CSFd	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	10		
$ADAF_2$	=	3		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL CHILD RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{2\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 2800\ cm2/day \times 0.2\ mg/cm2 \times 0.13 \times 350\ days/year \times 2\ years}{15\ kg \times 25550\ days} \times 10$$

DEXc = 2.66E-06 mg/kg/day

$$DEXc = \frac{2\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 2800\ cm2/day \times 0.2\ mg/cm2 \times 0.13 \times 350\ days/year \times 4\ years}{15\ kg \times 25550\ days} \times 3$$

DEXc = 1.60E-06 mg/kg/day

ILCR = (2.66E-06 mg/kg/day + 1.60E-06 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 3.1E-05

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from inhalation of surface soil at USCG Atwater.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT \times 24\ hours/day} \times ADAF$$

Where:

EC	=	estimated exposure concentration (mg/m3)
Ca	=	exposure point concentration in air (mg/m3)
	=	Cs x 1/PEF
Cs	=	exposure point concentration in soil (mg/kg)
PEF	=	particulate emission factor (m3/kg)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
IUR	=	inhalation unit risk($(ug/mg)^{-1}$)

RISKS:

ILCR = Exposure concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg

ASSUMPTIONS:

Cs	=	2	mg/kg	Chemical: Benzo(a)pyrene
PEF	=	9.50E+08	m3/kg	
Ca	=	2.11E-09	mg/m3	
ET	=	24	hr/day	
EF	=	350	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
ATc	=	25550	days	
IUR	=	1.1E-03	$(ug/m3)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$EC = \frac{2.11E\text{-}09 \text{ mg/m3} \times 24 \text{ hr/day} \times 350 \text{ days/year} \times 10 \text{ years}}{25550 \text{ days} \times 24 \text{ hours/day}} \times 3$$

EC = 8.65E-10 mg/m3

$$EC = \frac{2.11E\text{-}09 \text{ mg/m3} \times 24 \text{ hr/day} \times 350 \text{ days/year} \times 14 \text{ years}}{25550 \text{ days} \times 24 \text{ hours/day}} \times 1$$

EC = 4.04E-10 mg/m3

ILCR = (8.65E-10 mg/m3 + 4.04E-10 mg/m3) x 1.10E-03 (ug/m3)-1 x 1000 ug/mg

ILCR = 1.4E-09

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from inhalation of surface soil at USCG Atwater.

EQUATION:

$$EC = \frac{Ca \times ET \times EF \times ED}{AT \times 24\ hours/day} \times ADAF$$

Where:

EC	=	estimated exposure concentration (mg/m3)
Ca	=	exposure point concentration in air (mg/m3)
	=	Cs x 1/PEF
Cs	=	exposure point concentration in soil (mg/kg)
PEF	=	particulate emission factor (m3/kg)
ET	=	exposure time (hrs/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
IUR	=	inhalation unit risk($(ug/mg)^{-1}$)

RISKS:

ILCR = Exposure concentration (mg/m3) x IURi (ug/m3)-1 x 1000 ug/mg

ASSUMPTIONS:

Cs	=	2	mg/kg	Chemical: Benzo(a)pyrene
PEF	=	9.50E+08	m3/kg	
Ca	=	2.11E-09	mg/m3	
ET	=	24	hr/day	
EF	=	350	days/year	
ED_1	=	2	years	
ED_2	=	4	years	
ATc	=	25550	days	
IUR	=	1.1E-03	$(ug/m3)^{-1}$	
$ADAF_1$	=	10		
$ADAF_2$	=	3		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF FUGATIVE DUST EMISSIONS FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$EC = \frac{2.11E\text{-}09\ mg/m3 \times 24\ hr/day \times 350\ days/year \times 2\ years}{25550\ days \times 24\ hours/day} \times 10$$

EC = 5.77E-10 mg/m3

$$EC = \frac{2.11E\text{-}09\ mg/m3 \times 24\ hr/day \times 350\ days/year \times 4\ years}{25550\ days \times 24\ hours/day} \times 3$$

EC = 3.46E-10 mg/m3

ILCR = (5.77E-10 mg/m3 + 3.46E-10 mg/m3) x 1.10E-03 (ug/m3)-1 x 1000 ug/mg

ILCR = 1.0E-09

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL ADULT RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from dermal contact with surface soil at USCG Atwater.

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT} \times ADAF$$

Where:

DEX	=	estimated exposure intake (mg/kg/day)
Cs	=	exposure point concentration in soil (mg/kg)
CF	=	conversion factor (1.0E-6 kg/mg)
SA	=	skin surface available for contact (cm^2/day)
ABS	=	absorption factor (unitless)
AF	=	adherence factor (mg/cm^2)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
CSFd	=	dermal carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)-1

ASSUMPTIONS:

Cs	=	2	mg/kg	Chemical: Benzo(a)pyrene Equivalents
CF	=	1.0E-06	kg/mg	
SA	=	5700	cm^2/day	
AF	=	0.07	mg/cm^2	
ABS	=	0.13		
EF	=	350	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
BW	=	70	kg	
AT	=	25550	days	
CSFd	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL ADULT RESIDENTS EXPOSED TO SURFACE SOIL		
BASED ON: U.S. EPA, JULY 2004		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{2\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 5700\ cm2/day \times 0.07\ mg/cm2 \times 0.13 \times 350\ days/year \times 10\ years}{70\ kg \times 25550\ days} \times 3$$

DEXc = 6.09E-07 mg/kg/day

$$DEXc = \frac{2\ mg/kg \times 1.0E\text{-}06\ kg/mg \times 5700\ cm2/day \times 0.07\ mg/cm2 \times 0.13 \times 350\ days/year \times 14\ years}{70\ kg \times 25550\ days} \times 1$$

DEXc = 2.84E-07 mg/kg/day

ILCR = (6.09E-07 mg/kg/day + 2.84E-07 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 6.5E-06

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from ingestion of groundwater from USCG Atwater.

EQUATION:

$$IEX = \frac{Cgw \times CF \times IF \times EF \times ED}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cgw	=	exposure point concentration in groundwater (ug/L)
CF	=	conversion factor (1.0E-3 mg/ug)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cgw	=	0.029	ug/L	Chemical: Benzo(a)pyrene equivalents
IR	=	1	L/day	
CF	=	1.0E-03	mg/ug	
EF	=	350	days/year	
ED_1	=	2	years	
ED_2	=	4	years	
BW	=	15	kg	
ATc	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	10		
$ADAF_2$	=	3		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc \approx \frac{0.029\ ug/L \times 0.001\ mg/ug \times 1\ L/day \times 350\ days/year \times 2\ years}{15\ kg \times 25550\ days} \times 10$$

IEXc ≈ 5.30E-07 mg/kg/day

$$IEXc \approx \frac{0.029\ ug/L \times 0.001\ mg/ug \times 1\ L/day \times 350\ days/year \times 4\ years}{15\ kg \times 25550\ days} \times 3$$

IEXc ≈ 3.18E-07 mg/kg/day

ILCR ≈ (5.30E-07 mg/kg/day + 3.18E-07 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR ≈ 6.2E-06

CALCULATION WORKSHEET

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENT		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

PURPOSE: To estimate intake, carcinogenic risks for mutagenic chemicals from ingestion of groundwater from USCG Atwater.

EQUATION:

$$IEX = \frac{Cgw \times CF \times IF \times EF \times ED}{BW \times AT} \times ADAF$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cgw	=	exposure point concentration in groundwater (ug/L)
CF	=	conversion factor (1.0E-3 mg/ug)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
ADAF	=	age-dependent adjustment factor
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)-1

ASSUMPTIONS:

Cgw	=	0.029	ug/L	Chemical: Benzo(a)pyrene equivalents
IR	=	2	L/day	
CF	=	1.0E-03	mg/ug	
EF	=	350	days/year	
ED_1	=	10	years	
ED_2	=	14	years	
BW	=	70	kg	
ATc	=	25550	days	
CSFo	=	7.3E+00	$(mg/kg/day)^{-1}$	
$ADAF_1$	=	3		
$ADAF_2$	=	1		

CLIENT: USCG ATWATER, DETROIT, MICHIGAN		**JOB NUMBER:** 112G02435
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENT		
BASED ON: USEPA, DECEMBER 1989, MARCH 2005		
BY: L. CIOFANI	**CHECKED BY:**	**DATE:** 08/17/11

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{0.029\ ug/L \times 0.001\ mg/ug \times 2\ L/day \times 350\ days/year \times 10\ years}{70\ kg \times 25550\ days} \times 3$$

IEXc = 3.41E-07 mg/kg/day

$$IEXc = \frac{0.029\ ug/L \times 0.001\ mg/ug \times 2\ L/day \times 350\ days/year \times 14\ years}{70\ kg \times 25550\ days} \times 1$$

IEXc = 1.59E-07 mg/kg/day

ILCR = (3.41E-07 mg/kg/day + 1.59E-07 mg/kg/day) x 7.30E+00 (mg/kg/day)-1

ILCR = 3.6E-06

ATTACHMENT 6

VAPOR INTRUSION

Johnson and Ettinger Model Output Files

GW-ADV
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
91203	1.20E+02	Naphthalene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
8.3	15	137	137	0	0	A	SC	SC		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SC	1.63	0.385	0.197	SC	1.63	0.385	0.197	SC	1.63	0.385	0.197

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	244	0.1	0.25	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1
				Used to calculate risk-based groundwater concentration.	

END

DATA ENTRY SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
5.90E-02	7.50E-06	4.82E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	3.4E-05	3.0E-03

END

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
9.46E+08	122	0.188	0.188	0.188	0.299	1.74E-09	0.837	1.45E-09	30.00	0.385	0.030	0.355	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.69E+04	1.06E+06	3.77E-04	15	12,930	1.32E-04	5.71E-03	1.75E-04	1.56E-03	0.00E+00	0.00E+00	2.85E-04	7.43E-04	122

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	6.86E+02	0.10	8.33E+01	1.56E-03	4.00E+02	#NUM!	3.53E-04	2.42E-01	3.4E-05	3.0E-03

END

DATA ENTRY SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	3.10E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
3.4E-06	7.7E-02

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL DOWN TO "END"

END

GW-ADV Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_w (µg/L)	Chemical
91203	1.20E+02	Naphthalene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
8.3	15	137	137	0	0	A	SC	SC		

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
SC	1.63	0.385	0.197	SC	1.63	0.385	0.197	SC	1.63	0.385	0.197

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
10	40	1000	1000	300	0.1	0.83	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-06	1
				Used to calculate risk-based groundwater concentration.	

END

DATA ENTRY SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
5.90E-02	7.50E-06	4.82E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	3.4E-05	3.0E-03

END

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	122	0.188	0.188	0.188	0.299	1.74E-09	0.837	1.45E-09	30.00	0.385	0.030	0.355	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
6.92E+04	1.06E+06	3.77E-04	15	12,930	1.32E-04	5.71E-03	1.75E-04	1.56E-03	0.00E+00	0.00E+00	2.85E-04	7.43E-04	122

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^I) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
15	6.86E+02	0.10	8.33E+01	1.56E-03	4.00E+02	#NUM!	8.66E-05	5.94E-02	3.4E-05	3.0E-03

END

DATA ENTRY SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	3.10E+04	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
4.9E-07	1.4E-02

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL DOWN TO "END"

END

F

APPENDIX F

QUARTERLY MONITORING REPORTS
(INCLUDING DATA VALIDATION REPORTS)

QUARTERLY MONITORING REPORTS

SEPTEMBER 2011 REPORT

TETRA TECH NUS, INC.
661 Andersen Drive ▪ Pittsburgh, Pennsylvania 15220-2745
(412) 921-7000 ▪ FAX (412) 921-4040 ▪ www.tetratech.com

PTT 12-11-001

December 6, 2011

Ms. Lynn M. Keller
Environmental Engineer
USCG Civil Engineering Unit
1240 East Ninth St., Rm. 2179
Cleveland, OH 44199-2060

Reference: Contract Number HSCG83-08-D-3CL109
Task Order Number HSCG83-09-J-3CL358

Subject: Groundwater Monitoring Report (September 2011 Event) for U.S. Coast Guard Atwater Facility

Dear Ms. Keller:

Tetra Tech, Inc. (Tt) is pleased to submit this quarterly Groundwater Monitoring Letter Report for the referenced Task Order for the United States Coast Guard (USCG) Atwater Facility in Detroit, Michigan. The objective of this portion of the project includes quarterly monitoring of the groundwater associated with the Atwater Facility (Figure 1). The sampling is being performed according to Modification 002 of the Task Order.

Four quarterly groundwater sampling events will be performed. The first event was performed in April 2011 as part of the Site Investigation. The second event, described in this report, was performed in September 2011. The remaining events are scheduled for December 2011 and March 2012. Field activities and groundwater analytical results for the September 2011 event are summarized in this report. The work was performed in accordance to the Field Sampling Plan - Soil and Groundwater (Tetra Tech, 2011a) and the Quality Assurance Project Plan Addendum (Tetra Tech, 2011b).

FIELD OPERATIONS

Depth-to-water measurements were obtained at the four monitoring wells and to the Detroit River on September 14, 2011 (see Figure 1). Water level depths in the wells ranged from 1.70 (MW01) to 3.94 (MW03) feet below top of casing (BTOC). The depth to the river water surface was 4.50 feet from the reference point at the ground surface. Groundwater elevation data is provided in Table 1.

The groundwater level elevations in wells MW01 and MW02 were higher (0.52 foot to 0.63 foot) than during the June 2011 event. The groundwater levels in the MW03 and MW04 were much closer to the levels measured in June 2011 (within 0.13 foot). The groundwater flow direction was toward the river. The river water level elevation was 0.65 foot lower than during the June sampling event.

On September 14, 2011, Tt collected groundwater samples from the four monitoring wells. A duplicate sample was collected from well MW03. Samples were collected using low flow methods. Copies of the Groundwater Sample Log Sheets and Low Flow Purge Data Sheets are included in Attachment A. Following collection, the groundwater samples were shipped to Trimatrix Laboratories in Grand Rapids, Michigan for analysis of polynuclear aromatic hydrocarbons (PAHs) by EPA Method SW846 8310, and for total and dissolved Michigan 10 metals by EPA Methods 6020A and 7470A. Groundwater for dissolved metals analyses were filtered in the field using a 0.45 micron filter. Purge water was drummed on-site

and was subsequently disposed of off-site by EarthSmart Environmental Solutions, LLC after confirming the results of the groundwater analyses.

RESULTS

The analytical results for this event are summarized in Table 2. This table also includes the results from the previous sampling event. A copy of the laboratory reports are provided in Attachment B. The data validation report is included in Attachment C as a separate pdf.

The results were similar to the previous sampling event. As in the first round, the highest concentrations of PAHs were in the sample from MW02. The concentrations of naphthalene and 2-methylnaphthalene were slightly higher compared to the last event, although concentrations were still less than the Michigan Department of Environmental Quality (MDEQ) residential exposure criteria. In addition, the concentration of benzo(a)pyrene was 1 µg/L (estimated) in this round, which is greater than the USEPA Maximum Contaminant Level (MCL). In the June 2001 sampling event, the concentration of benzo(a)pyrene was less than the detection limit. However, the turbidity value (1.7 NTU) for this event was slightly higher than the last event (0 NTU), and the suspended solids may contribute to the higher concentrations of PAHs.

Total metals concentrations were generally slightly higher compared to the last event. At well MW02, the total arsenic concentration was 12 µg/L, and the dissolved arsenic concentration was 9 µg/L compared to the criteria (MCL) of 10 µg/L. In the June 2011 sampling event, the total and dissolved arsenic concentrations were 6.2 µg/L and 1 µg/L (estimated), respectively. However, the turbidity value for this event (1.7 NTU) was slightly higher than the last event (0 NTU), and the suspended solids may contribute to the higher concentrations of arsenic. Dissolved metals concentrations were similar to the last event.

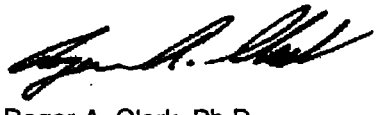
CONCLUSIONS and RECOMMENDATIONS

Except for the elevated concentrations of arsenic and benzo(a)pyrene in well MW02, no significant changes in the concentrations of contaminants in the groundwater were observed.

There are no recommendations for changes to the monitoring program. The next event is scheduled for December 2011.

Should you have any questions, please contact the Project Manager, Mr. Joseph Logan at (412) 921-7231 or me at (412) 921-8415.

Very truly yours,



Roger A. Clark, Ph.D.
Program Manager

RAC

cc: file 112G02435
Joseph Logan

FIGURE

PGH P:\GIS\COASTGUARD\DETROIT_USCG\MAPDOCS\MXD\ATWATER_SURVEYED_MWS.MXD 08/16/11 JEE

DRAWN BY: J. ENGLISH	DATE: 07/29/11		MONITORING WELLS USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER: 02435	CTO NUMBER: ___
CHECKED BY: S. HILL	DATE: 08/16/11			APPROVED BY: ___	DATE: ___
REVISED BY:	DATE:			APPROVED BY: ___	DATE: ___
SCALE: AS NOTED				FIGURE NO.: 1 2 - 2	REV: 0

TABLES

TABLE 1

WATER LEVEL MEASUREMENTS
QUARTERLY MONITORING REPORT FOR SEPTEMBER 2011 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Well ID	Ground Surface Elevation (feet, NAVD 88)	Top of Casing (feet, NAVD 88)	Screened Interval		9/14/2011		6/6/2011	
			Top (feet bgs)	Bottom (feet bgs)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)
MW01	579.58	579.53	3.0	13.0	1.70	577.83	2.22	577.31
MW02	579.54	579.62	3.0	13.0	3.32	576.30	3.95	575.67
MW03	579.33	579.00	3.0	13.0	3.94	575.06	3.89	575.11
MW04	578.68	578.11	3.0	13.0	3.05	575.06	3.18	574.93
River Level	578.69	NA	NA	NA	4.50	574.19	3.85	574.84

Notes:
bgs - below ground surface
BTOC - below top of casing
NAVD - North American Vertical Datum
NA - Not Applicable

TABLE 2

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR SEPTEMBER 2011 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 1

LOCATION	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	DAMW01		DAMW02		DAMW03				DAMW04	
SAMPLE DATE					6/6/2011	9/14/2011	6/6/2011	9/14/2011	6/6/2011	6/6/2011-D	9/14/2011	9/14/2011-D	6/6/2011	9/14/2011
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)														
ARSENIC	10	10	10	10	0.95 J	0.73 J	1 J	9	2.7 J	2.7 J	4.3 J	4.1 J	3 J	3.6 J
BARIUM	2000	2000	670	2000	190 J	300	200 J	150	310 J	300 J	370	360	150 J	210
CHROMIUM	100	100	100	100	0.3 J	0.27 J	0.47 J	0.45 J	0.21 J	1 U	0.22 J	0.23 J	1 U	1 U
COPPER	1300	1000	13	1300	0.44 J	0.61 J	0.42 J	0.16 J	1 U	1 U	1 U	0.15 J	0.88 J	0.6 J
LEAD	15	2	14	15	0.17 J	0.18 J	0.2 J	1 U	1 U	1 U	1 U	1 U	0.44 J	0.45 J
SELENIUM	50	50	5	50	5 UJ	1.1 J	5 UJ	5 UJ	5 UJ	5 UJ	0.97 J	0.96 J	5 UJ	5 UJ
ZINC	NC	2400	170	2400	5.5	6.7	5 U	5 U	4.2 J	3.9 J	5.5	5 U	110	100
METALS (UG/L)														
ARSENIC	10	10	10	10	1.5 J	1 J	6.2	12	2.6 J	2.5 J	4.8 J	4.4 J	3 J	3.8 J
BARIUM	2000	2000	670	2000	210	300	150	160	290	290	370	340	150	210
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.37 U	1.1 J	0.2 U	0.2 U
CHROMIUM	100	100	100	100	0.31 J	0.25 J	0.33 J	0.51 J	0.29 J	0.27 J	0.24 J	0.24 J	0.36 J	1 U
COPPER	1300	1000	13	1300	0.74 J	0.79 J	1.2	0.29 J	0.77 J	1 U	0.3 J	0.37 J	2.6	1.8
LEAD	15	2	14	15	0.73 J	1	0.85 J	0.39 J	0.47 J	0.33 J	0.7 J	0.57 J	2.1	3.3
SELENIUM	50	50	5	50	5 UJ	5 UJ	1 J	1.5 J	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
ZINC	NC	2400	170	2400	6.9 J	9.4	3.9 J	6.4	8.5 J	4.6 J	10	8.4	110 J	120
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)														
2-METHYLNAPHTHALENE	NC	260	19	260	0.5 U	0.5 U	24 J	43	0.07 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACENAPHTHENE	NC	1300	38	1300	0.5 U	0.031 J	6 J	14	1.6	1.6	2.6	2.9	0.05 J	0.03 J
ACENAPHTHYLENE	NC	52	ID	52	0.5 U	0.5 U	1.7 J	3.8 J	0.05 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ANTHRACENE	NC	43	ID	43	0.5 U	0.5 U	3.8 J	4.8 J	0.22 J	0.19 J	0.23 J	0.23 J	0.5 U	0.5 U
BENZO(A)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.28 J	1.3 J	0.5 U	0.5 U	0.072 J	0.051 J	0.5 U	0.5 U
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.5 UJ	1 J	0.5 U	0.5 U	0.052 J	0.5 U	0.5 U	0.5 U
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.05 J	12 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.1 J	12 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
FLUORANTHENE	NC	210	1.6	210	0.5 U	0.5 U	0.52 J	1.5 J	0.2 J	0.15 J	0.27 J	0.23 J	0.5 U	0.5 U
FLUORENE	NC	880	12	880	0.5 U	0.5 U	3.5 J	13	0.36 J	0.27 J	0.19 J	0.28 J	0.5 U	0.5 U
NAPHTHALENE	NC	520	11	520	0.5 U	0.5 U	120	170	0.19 J	0.11 J	0.062 J	0.5 U	0.05 J	0.5 U
PHENANTHRENE	NC	52	2	52	0.5 U	0.5 U	8.8 J	11 J	1.2	1	1.4	1.5	0.05 J	0.5 U
PYRENE	NC	140	ID	140	0.5 U	0.5 U	0.39 J	1.5 J	0.15 J	0.13 J	0.23 J	0.24 J	0.04 J	0.5 U

1 - For comparison only.
J - Estimated Concentration.
U - Below detection limit at detection limit shown.
D - Duplicate sample
Shaded cell indicates concentration greater than selected criterion.
bgs - Below ground surface.
GSI - Groundwater-surface water interface
ID - Insufficient data to develop criterion.
MCL - Maximum Contaminant Level.
NC - No criterion.
PAHs - Polynuclear aromatic hydrocarbons.
RBSL - Risk-Based Screening Level

ATTACHMENT A
FIELD FORMS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02453

Sample ID No.: DA-GW-01-042011
Sample Location: MW01
Sampled By: CW
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 9/14/2011	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1400	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	PPT	ORP
Method: Peristaltic Pump	CLEAR	6.46	1.041	20.51	2.00	0.26	0.5	-158

PURGE DATA:

Date: 9/14/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Peristaltic Pump								
Monitor Reading (ppm): -								
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD): 13.08								
Static Water Level (WL): 1.67								
One Casing Volume(gal/L): 1.25								
Start Purge (hrs): 1310								
End Purge (hrs): 1400								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 15								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		6 ~~2~~ x 1L amber	X
Metals	HNO3	3 ~~1~~ x 250 ml plastic	X
Diss Metals	HNO3	3 ~~1~~ x 250 ml plastic	X

OBSERVATIONS / NOTES:

Circle if Applicable: MS/MSD

Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02453
WELL ID.: MW01
DATE: 9/14/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % o (ppt)	Comments
1310	1.67	250	7.20	1.07	41.4	1.75	21.79	-143	0.5	CLEAR
1320	1.75	250	6.63	1.06	5.62	0.61	20.15	-146	0.5	
1330	1.79	250	6.60	1.05	0.64	0.57	20.48	-156	0.5	
1340	1.80	250	6.62	1.04	0.00	0.32	20.57	-161	0.5	
1350	1.81	250	6.51	1.04	0.00	0.27	20.56	-158	0.5	
1400	1.81	250	6.46	1.04	0.00	0.26	20.51	-158	0.5	SAMPLED MS/MSD

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02453

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: ~~DA~~-GW-02-09142011
Sample Location: MW02
Sampled By: CW
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/14/2011	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1540	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	~~(%)~~ PPT	ORP
Method: Peristaltic Pump	clear	7.26	1.58	18.99	1.71	0.34	0.7	-292

PURGE DATA:

Date: 9/14/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Peristaltic Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.10								
Static Water Level (WL): 3.33								
One Casing Volume(gal/L): 3.3								
Start Purge (hrs): 1440								
End Purge (hrs): 1540								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	X
Metals	HNO3	1 x 250 ml plastic	X
Diss Metals	HNO3	1 x 250 ml plastic	X

OBSERVATIONS / NOTES:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02453
WELL ID.: MW02
DATE: 9/14/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppb	Comments
1440	3.33	250	7.11	1.25	1.20	1.80	25.63	-200	0.6	CLEAR - ORGANIC ODOR
1450	3.91	150	7.01	1.34	2.43	1.08	26.47	-235	0.7	
1500	4.33	100	7.54	1.49	1.96	0.67	19.77	-247	0.7	
1510	4.45	100	7.60	1.46	2.08	0.60	19.67	-295	0.7	
1520	4.47	100	7.38	1.42	1.85	0.40	19.38	-286	0.7	
1530	4.47	100	7.29	1.39	1.80	0.38	19.12	-280	0.7	
1540	4.47	100	9.26	1.38	1.71	0.37	18.99	-272	0.7	SAMPLED

2.5
1.5

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02453

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: DA-GW-03-092011
Sample Location: DA-MW03
Sampled By: S. Hill
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/14/2011	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Time: ~~1345~~ 1345								
Method: Peristaltic Pump	Clear	6.74	6.990	21.75	1.3	D.O	—	-92

PURGE DATA:

Date: 9/14/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Peristaltic Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.29								
Static Water Level (WL): 3.98								
One Casing Volume(gal/L):								
Start Purge (hrs): 1315								
End Purge (hrs): 1545								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 1.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	Yes
Metals	HNO3	1 x 250 ml plastic	Yes
Diss Metals	HNO3	1 x 250 ml plastic	Yes

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	DA-GW-FD-101

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02453
WELL ID.: DA-MW03
DATE: 9/14/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1315	3.90	Start	pump							
1325	3.90	200	7.04	1.18	10.36	0.0	21.05	-113	—	
1335	3.95	200	6.77	0.979	1.7	0.0	21.55	-95	—	
1340	3.95	200	6.74	0.962	1.5	0.0	21.75	-93	—	
1345	3.95	200	6.74	0.990	1.3	0.0	21.75	-92	—	
↳ collect sample										

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: USCG Atwater
Project No.: 112G02453

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: DA-GW04-092011
Sample Location: DAMW04
Sampled By: S. Hill
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/14/2011	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Time: 1545								
Method: Peristaltic Pump	Clear	6.65	0.563	22.79	0.0	0.0	—	-21

PURGE DATA:

Date: 9/14/2011	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Peristaltic Pump								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD): 13.15								
Static Water Level (WL): 3.07								
One Casing Volume(gal/L):								
Start Purge (hrs): 1450								
End Purge (hrs): 1525								
Total Purge Time (min): 35								
Total Vol. Purged (gal): 2								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs		2 x 1L amber	
Metals	HNO3	1 x 250 ml plastic	
Diss Metals	HNO3	1 x 250 ml plastic	

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Atwater
PROJECT NUMBER: 112G02453
WELL ID.: DA-MW04
DATE: 9/14/2011

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1450	3.07	Start purge								
1455	3.13	200	7.07	0.993	3-8	0.0	25.61	-96	—	
1500	3.13	200	6.84	0.889	0.0	0.0	23.85	-61	—	
1510	3.18	200	6.71	0.862	3.2	0.0	23.37	-26	—	
1515	3.20	200	6.70	0.861	2-3	0.0	23.22	-23	—	
1520	3.22	200	6.68	0.864	0.0	0.0	22.95	-22	—	
1525	3.22	200	6.65	0.863	0.0	0.0	22.79	-21	—	
↳	collect sample									

SIGNATURE(S):

ATTACHMENT B
LABORATORY REPORTS

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1109231**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW01-092011**	Sampled:	09/14/11 14:00
Lab Sample ID:	**1109231-03**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	09/16/11 09:00
Unit:	ug/L	Prepared:	09/21/11 By: ALK
Dilution Factor:	1	Analyzed:	09/29/11 By: DWJ
QC Batch:	1110061	Analytical Batch:	1I29070

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.031J**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	0.50U	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
* *Nitrobenzene-d5*	76	*40-110*
2-Fluorobiphenyl	63	*50-110*
o-Terphenyl	71	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1109231**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW02-092011**	Sampled:	09/14/11 15:40
Lab Sample ID:	**1109231-05**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	09/16/11 09:00
Unit:	ug/L	Prepared:	09/21/11 By: ALK
Dilution Factor:	25	Analyzed:	10/01/11 By: DWJ
QC Batch:	1110061	Analytical Batch:	1J03058

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**14**	12	0.72
208-96-8	Acenaphthylene	**3.8J**	12	0.90
120-12-7	Anthracene	**4.8J**	12	0.95
56-55-3	Benzo(a)anthracene	**1.3J**	12	0.80
50-32-8	Benzo(a)pyrene	**1.0J**	12	0.74
205-99-2	Benzo(b)fluoranthene	12U	12	1.7
207-08-9	Benzo(k)fluoranthene	12U	12	0.99
191-24-2	Benzo(g,h,i)perylene	12U	12	6.8
218-01-9	Chrysene	12U	12	0.89
53-70-3	Dibenz(a,h)anthracene	12U	12	2.9
206-44-0	Fluoranthene	**1.5J**	12	0.82
86-73-7	Fluorene	**13**	12	1.1
193-39-5	Indeno(1,2,3-cd)pyrene	12U	12	2.8
91-57-6	2-Methylnaphthalene	**43**	12	0.90
91-20-3	Naphthalene	**170**	12	0.77
85-01-8	Phenanthrene	**11J**	12	0.87
129-00-0	Pyrene	**1.5J**	12	0.94

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1109231**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW03-092011**	Sampled:	09/14/11 13:45
Lab Sample ID:	**1109231-01**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	09/16/11 09:00
Unit:	ug/L	Prepared:	09/21/11 By: ALK
Dilution Factor:	1	Analyzed:	09/29/11 By: DWJ
QC Batch:	1110061	Analytical Batch:	1I29070

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**2.6**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	**0.23J**	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.072J**	0.50	0.032
50-32-8	Benzo(a)pyrene	**0.052J**	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.27J**	0.50	0.033
86-73-7	Fluorene	**0.19J**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	**0.062J**	0.50	0.031
85-01-8	Phenanthrene	**1.4**	0.50	0.035
129-00-0	Pyrene	**0.23J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	77	*40-110*
2-Fluorobiphenyl	68	*50-110*
o-Terphenyl	86	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1109231**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW04-092011**	Sampled:	09/14/11 15:45
Lab Sample ID:	**1109231-04**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	09/16/11 09:00
Unit:	ug/L	Prepared:	09/21/11 By: ALK
Dilution Factor:	1	Analyzed:	09/29/11 By: DWJ
QC Batch:	1110061	Analytical Batch:	1I29070

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.030J**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	0.50U	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	77	*40-110*
2-Fluorobiphenyl	75	*50-110*
o-Terphenyl	70	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1109231**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-FD-101**	Sampled:	09/14/11 00:00
Lab Sample ID:	**1109231-02**	Sampled By:	Ms. Shannon Hill
Matrix:	Water	Received:	09/16/11 09:00
Unit:	ug/L	Prepared:	09/21/11 By: ALK
Dilution Factor:	1	Analyzed:	09/29/11 By: DWJ
QC Batch:	1110061	Analytical Batch:	1I29070

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**2.9**	0.50	0.029
*208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	**0.23J**	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.051J**	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.23J**	0.50	0.033
86-73-7	Fluorene	**0.28J**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	**1.5**	0.50	0.035
129-00-0	Pyrene	**0.24J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	77	*40-110*
2-Fluorobiphenyl	69	*50-110*
o-Terphenyl	79	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

STATEMENT OF DATA QUALIFICATIONS

Semivolatile Organic Compounds by EPA Method 8270C

Qualification: Manual integration was performed on this sample for the analyte(s) listed below in accordance with the TriMatrix Manual Integration SOP. All necessary documentation, including the signed review, is included in the raw data section of the data package.

Analysis: USEPA-8270C

Sample/Analyte:		
1109231-02	DA-GW-FD-101	Acenaphthylene
1109231-03	DA-GW01-092011	Nitrobenzene-d5
1110061-BS1		Acenaphthylene
1J03058-CCV1		Acenaphthylene

Qualification: The analyte concentration in the sample exceeded the calibrated range of the instrument. The sample result is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:		
1106105-02	DA-GW-02-062011	Naphthalene

Qualification: The RL for this analysis has been elevated due to sample matrix interference.

Analysis: USEPA-8270C

Sample/Analyte: 1109231-05 DA-GW02-092011

Qualification: One or more surrogate recoveries for the sample were less than the lower control limit but greater than or equal to 10%. All results are considered estimated.

Analysis: USEPA-8270C

Sample/Analyte: 1106105-02 DA-GW-02-062011

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-01-062011**	Sampled:	06/06/11 14:10
Lab Sample ID:	**1106105-01**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
***Arsenic**	**0.95**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:04	MSM	1105592
***Barium**	**190**		10	ug/L	5	USEPA-6020A	06/14/11 16:49	MSM	1105592
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:34	MSM	1105592
Chromium	**0.30**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:04	MSM	1105592
Copper	**0.44**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:04	MSM	1105592
Lead	**0.17**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:04	MSM	1105592
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/16/11 08:30	DSC	1105861
*Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:34	MSM	1105592
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 16:04	MSM	1105592
Zinc	**5.5**		5.0	ug/L	1	USEPA-6020A	06/14/11 16:04	MSM	1105592

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-01-062011**	Sampled:	06/06/11 14:10
Lab Sample ID:	**1106105-01**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.5**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Barium	**210**		10	ug/L	5	USEPA-6020A	06/14/11 16:38	MSM	1105591
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:16	MSM	1105591
Chromium	**0.31**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Copper	**0.74**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Lead	**0.73**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 10:55	KLV	1105860
*Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:16	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591
***Zinc**	**6.9**		5.0	ug/L	1	USEPA-6020A	06/14/11 15:38	MSM	1105591

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.0**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:13	MSM	1105592
Barium	**200**		10	ug/L	5	USEPA-6020A	06/14/11 16:58	MSM	1105592
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:41	MSM	1105592
Chromium	**0.47**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:13	MSM	1105592
Copper	**0.42**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:13	MSM	1105592
Lead	**0.20**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:13	MSM	1105592
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/16/11 08:44	DSC	1105861
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:41	MSM	1105592
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 16:13	MSM	1105592
Zinc	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 16:13	MSM	1105592

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-02-062011**	Sampled:	06/06/11 15:30
Lab Sample ID:	**1106105-02**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**6.2**		5.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Barium	**150**		10	ug/L	5	USEPA-6020A	06/14/11 16:44	MSM	1105591
Cadmium	**0.075**	J	0.20	ug/L	1	USEPA-6020A	06/14/11 18:23	MSM	1105591
Chromium	**0.33**	J	1.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Copper	**1.2**		1.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Lead	**0.85**	J	1.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:09	KLV	1105860
Selenium	**1.0**	J	5.0	ug/L	1	USEPA-6020A	06/14/11 18:23	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591
Zinc	**3.9**	J	5.0	ug/L	1	USEPA-6020A	06/14/11 15:48	MSM	1105591

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-03-062011**	Sampled:	06/06/11 15:15
Lab Sample ID:	**1106105-03**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**2.7**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:15	MSM	1105592
Barium	**310**		10	ug/L	5	USEPA-6020A	06/14/11 16:59	MSM	1105592
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:42	MSM	1105592
Chromium	**0.21**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:15	MSM	1105592
Copper	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 16:15	MSM	1105592
Lead	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 16:15	MSM	1105592
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/16/11 08:49	DSC	1105861
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:42	MSM	1105592
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 16:15	MSM	1105592
Zinc	**4.2**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:15	MSM	1105592

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-03-062011**	Sampled:	06/06/11 15:15
Lab Sample ID:	**1106105-03**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**2.6**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Barium	**290**		10	ug/L	5	USEPA-6020A	06/14/11 16:45	MSM	1105591
Cadmium	**0.051**	**J**	0.20	ug/L	1	USEPA-6020A	06/14/11 18:24	MSM	1105591
Chromium	**0.29**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Copper	**0.77**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Lead	**0.47**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:14	KLV	1105860
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:24	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591
Zinc	**8.5**		5.0	ug/L	1	USEPA-6020A	06/14/11 15:50	MSM	1105591

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-04-062011**	Sampled:	06/06/11 13:34
Lab Sample ID:	**1106105-04**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**3.0**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:26	MSM	1105592
Barium	**150**		10	ug/L	5	USEPA-6020A	06/14/11 17:00	MSM	1105592
Cadmium	**0.062**	**J**	0.20	ug/L	1	USEPA-6020A	06/14/11 18:48	MSM	1105592
Chromium	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 16:26	MSM	1105592
Copper	**0.88**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:26	MSM	1105592
Lead	**0.44**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 16:26	MSM	1105592
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/16/11 08:54	DSC	1105861
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:48	MSM	1105592
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 16:26	MSM	1105592
Zinc	**110**		25	ug/L	5	USEPA-6020A	06/14/11 17:00	MSM	1105592

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-04-062011**	Sampled:	06/06/11 13:34
Lab Sample ID:	**1106105-04**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**3.0**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Barium	**150**		10	ug/L	5	USEPA-6020A	06/14/11 16:47	MSM	1105591
Cadmium	**0.060**	**J**	0.20	ug/L	1	USEPA-6020A	06/14/11 18:26	MSM	1105591
Chromium	**0.36**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Copper	**2.6**		1.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Lead	**2.1**		1.0	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:19	KLV	1105860
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:26	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:52	MSM	1105591
Zinc	**110**		25	ug/L	5	USEPA-6020A	06/14/11 16:47	MSM	1105591

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	*USCG Atwater Facility*	Description:	Laboratory Services
Client Sample ID:	**DA-GW-FD-01**	Sampled:	06/06/11 00:00
Lab Sample ID:	**1106105-05**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**2.7**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:28	MSM	1105592
Barium	**300**		10	ug/L	5	USEPA-6020A	06/14/11 17:01	MSM	1105592
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:49	MSM	1105592
Chromium	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 16:28	MSM	1105592
Copper	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 16:28	MSM	1105592
Lead	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 16:28	MSM	1105592
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/16/11 08:59	DSC	1105861
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:49	MSM	1105592
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 16:28	MSM	1105592
Zinc	**3.9**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 16:28	MSM	1105592

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1106105**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-FD-01**	Sampled:	06/06/11 00:00
Lab Sample ID:	**1106105-05**	Sampled By:	Mr. Charlie Warino
Matrix:	Water	Received:	06/07/11 08:55

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**2.5**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:58	MSM	1105591
Barium	**290**		10	ug/L	5	USEPA-6020A	06/14/11 16:48	MSM	1105591
Cadmium	<0.20	U	0.20	ug/L	1	USEPA-6020A	06/14/11 18:30	MSM	1105591
Chromium	**0.27**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:58	MSM	1105591
Copper	<1.0	U	1.0	ug/L	1	USEPA-6020A	06/14/11 15:58	MSM	1105591
Lead	**0.33**	**J**	1.0	ug/L	1	USEPA-6020A	06/14/11 15:58	MSM	1105591
Mercury	<0.20	U	0.20	ug/L	1	USEPA-7470A	06/20/11 11:24	KLV	1105860
Selenium	<5.0	U	5.0	ug/L	1	USEPA-6020A	06/14/11 18:30	MSM	1105591
Silver	<0.50	U	0.50	ug/L	1	USEPA-6020A	06/14/11 15:58	MSM	1105591
Zinc	**4.6**	**J**	5.0	ug/L	1	USEPA-6020A	06/14/11 15:58	MSM	1105591

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TRIMATRIX LABORATORIES

STATEMENT OF DATA QUALIFICATIONS

Dissolved Metals by EPA 6000/7000 Series Methods

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte: 1106105-01 DA-GW-01-062011 Selenium

Qualification: The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte: 1106105-01 DA-GW-01-062011 Barium

Qualification: This analyte was not present in this sample at a concentration greater than 100 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6020A

Sample/Analyte: 1106105-01 DA-GW-01-062011 Arsenic

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TRIMATRIX LABORATORIES

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte:		
1106105-01	DA-GW-01-062011	Selenium
1106105-01	DA-GW-01-062011	Zinc

Qualification: The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte:		
1106105-01	DA-GW-01-062011	Zinc

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ATTACHMENT C
DATA VALIDATION REPORT
(on pdf)

SEPTEMBER 2011 DATA VALIDATION REPORT

DATA VALIDATION REPORT IS PROVIDED ON CD

DECEMBER 2011 REPORT

TETRA TECH, INC.
661 Andersen Drive ▪ Pittsburgh, Pennsylvania 15220-2745
(412) 921-7000 ▪ FAX (412) 921-4040 ▪ www.tetratech.com

PITT 02-12-002

February 14, 2012

Ms. Lynn M. Keller
Environmental Engineer
USCG Civil Engineering Unit
1240 East Ninth St., Rm. 2179
Cleveland, OH 44199-2060

Reference: Contract Number HSCG83-08-D-3CL109
Task Order Number HSCG83-09-J-3CL358

Subject: Groundwater Monitoring Report (December 2011 Event) for U.S. Coast Guard Atwater Facility

Dear Ms. Keller:

Tetra Tech, Inc. (Tt) is pleased to submit this quarterly Groundwater Monitoring Letter Report for the referenced Task Order for the United States Coast Guard (USCG) Atwater Facility in Detroit, Michigan. The objective of this portion of the project includes quarterly monitoring of the groundwater associated with the Atwater Facility (Figure 1). The sampling is being performed according to Modification 002 of the Task Order.

Four quarterly groundwater sampling events will be performed. The first event was performed in April 2011 as part of the Site Investigation and the second event was performed in September 2011. The third event, described in this report, was performed in December 2011. The remaining event is scheduled for March 2012. Field activities and groundwater analytical results for the December 2011 event are summarized in this report. The work was performed in accordance to the Field Sampling Plan - Soil and Groundwater (Tetra Tech, 2011) and the Quality Assurance Project Plan Addendum (Tetra Tech, 2011).

FIELD OPERATIONS

Depth-to-water measurements were obtained at the four monitoring wells and to the Detroit River on December 16, 2011 (see Figure 1). Water level depths in the wells ranged from 1.00 (MW01) to 4.08 (MW03) feet below top of casing (BTOC). The depth to the river water surface was 4.20 feet from the reference point at the ground surface. Groundwater elevation data is provided in Table 1.

The groundwater level elevations in wells MW01, MW02, and MW04 were higher (0.12 foot to 0.70 foot) than during the September 2011 event. The groundwater level in MW03 was less than the level measured in September 2011 (0.14 foot). The groundwater flow direction was toward the river. The river water level elevation was 0.30 foot higher than during the September sampling event.

On December 16, 2011, Tt collected groundwater samples from the four monitoring wells. A duplicate sample was collected from well MW02. Samples were collected using low flow methods. Copies of the Groundwater Sample Log Sheets and Low Flow Purge Data Sheets are included in Attachment A. Following collection, the groundwater samples were shipped to Trimatrix Laboratories in Grand Rapids, Michigan for analysis of polynuclear aromatic hydrocarbons (PAHs) by EPA Method SW846 8310, and for total and dissolved Michigan 10 metals by EPA Methods 6020A and 7470A. Groundwater for dissolved metals analyses were filtered in the field using a 0.45 micron filter. Purge water was drummed on-site

and was subsequently disposed of off-site by EarthSmart Environmental Solutions, LLC after confirming the results of the groundwater analyses (see Attachment B).

RESULTS

The analytical results for this event are summarized in Table 2. This table also includes the results from the previous sampling events. A copy of the laboratory reports are provided in Attachment C. The data validation report is included in Attachment D as a separate pdf.

The analytical results were similar to the previous sampling event. As in the previous rounds, the highest concentrations of PAHs were in the sample from MW02. The concentrations of naphthalene and 2-methylnaphthalene were slightly lower compared to the last event, and concentrations were still less than the Michigan Department of Environmental Quality (MDEQ) residential exposure criteria.

In addition, the concentration of benzo(a)pyrene in MW04 was 0.24 µg/L (estimated) in this round, which is greater than the USEPA Maximum Contaminant Level (MCL). In the previous sampling events, the concentration of benzo(a)pyrene was less than the detection limit.

Total metals concentrations were generally slightly lower compared to the last event. Dissolved metals concentrations were similar to the last event.

At well MW02, the total arsenic concentration was 9.5 µg/L (and the concentration in the duplicate was 10 µg/L), and the dissolved arsenic concentration was 9.3 µg/L (and the concentration in the duplicate was 9.2 µg/L) compared to the criteria (MCL) of 10 µg/L. In the September 2011 sampling event, the total and dissolved arsenic concentrations were 12 µg/L and 9 µg/L (estimated), respectively. In the June 2011 sampling event, the total and dissolved arsenic concentrations were 6.2 µg/L and 1 µg/L (estimated), respectively. The turbidity value for the December 2011 event (1.2 NTU) was slightly less than the last event (1.7 NTU), and the lower suspended solids may contribute to the lower concentrations of arsenic.

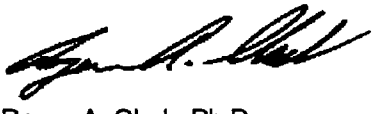
CONCLUSIONS and RECOMMENDATIONS

Except for the elevated concentration of benzo(a)pyrene in well MW04, no significant changes in the concentrations of contaminants in the groundwater were observed.

There are no recommendations for changes to the monitoring program. The next event is scheduled for March 2012.

Should you have any questions, please contact the Project Manager, Mr. Joseph Logan at (412) 921-7231 or me at (412) 921-8415.

Very truly yours,



Roger A. Clark, Ph.D.
Program Manager

RAC

cc: file 112G02435
Joseph Logan

FIGURE

PGH P:\GIS\COASTGUARD\DETROIT_USCG\MAPDOCS\MXD\ATWATER_SURVEYED_MWS.MXD 08/16/11 JEE

DRAWN BY J. ENGLISH	DATE 07/29/11		MONITORING WELLS USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER 02435	CTO NUMBER —
CHECKED BY S. HILL	DATE 08/16/11			APPROVED BY —	DATE —
REVISED BY	DATE			APPROVED BY —	DATE —
SCALE AS NOTED				FIGURE NO. 12 - 2	REV 0

TABLES

TABLE 1

WATER-LEVEL MEASUREMENTS
QUARTERLY MONITORING REPORT FOR SEPTEMBER 2011 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Well ID	Ground Surface Elevation (feet, NAVD 88)	Top of Casing (feet, NAVD 88)	Screened Interval		12/16/2011		9/14/2011		6/6/2011	
			Top (feet bgs)	Bottom (feet bgs)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)
MW01	579.58	579.53	3.0	13.0	1.00	578.53	1.70	577.83	2.22	577.31
MW02	579.54	579.62	3.0	13.0	3.20	576.42	3.32	576.30	3.95	575.67
MW03	579.33	579.00	3.0	13.0	4.08	574.92	3.94	575.06	3.89	575.11
MW04	578.68	578.11	3.0	13.0	2.49	575.62	3.05	575.06	3.18	574.93
River Level	578.69	NA	NA	NA	4.20	574.49	4.50	574.19	3.85	574.84

Notes:
bgs - below ground surface
BTOC - below top of casing
NAVD - North American Vertical Datum
NA - Not Applicable

TABLE 2

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR SEPTEMBER 2011 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 2

LOCATION	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	DAMW01			DAMW02			
SAMPLE DATE					6/6/2011	9/14/2011	12/16/2011	6/6/2011	9/14/2011	12/16/2011	12/16/2011-D
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)											
ARSENIC	10	10	10	10	0.95 J	0.73 J	0.36 J	1 J	9	9.3	9.2
BARIUM	2000	2000	670	2000	190 J	300	260	200 J	150	110	100
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.14 J	0.2 U	0.2 U	0.058 J	0.046 J
CHROMIUM	100	100	100	100	0.3 J	0.27 J	1 U	0.47 J	0.45 J	0.36 J	0.37 J
COPPER	1300	1000	13	1300	0.44 J	0.61 J	0.28 J	0.42 J	0.16 J	1 U	0.28 J
LEAD	15	2	14	15	0.17 J	0.18 J	1 U	0.2 J	1 U	1 U	1 U
SELENIUM	50	50	5	50	5 UJ	1.1 J	0.5 U	5 UJ	5 UJ	0.5 U	0.5 U
ZINC	NC	2400	170	2400	5.5	6.7	6.5 U	5 U	5 U	6.9 U	7.8 U
METALS (UG/L)											
ARSENIC	10	10	10	10	1.5 J	1 J	0.52 J	6.2	12	9.5	10
BARIUM	2000	2000	670	2000	210	300	260	150	160	110	110
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.79 J	0.2 U	0.2 U	0.73 J	0.054 J
CHROMIUM	100	100	100	100	0.31 J	0.25 J	0.57 J	0.33 J	0.51 J	0.39 J	0.38 J
COPPER	1300	1000	13	1300	0.74 J	0.79 J	0.98 J	1.2	0.29 J	0.19 J	0.39 J
LEAD	15	2	14	15	0.73 J	1	0.63 J	0.85 J	0.39 J	0.16 J	0.23 J
SELENIUM	50	50	5	50	5 UJ	5 UJ	5 U	1 J	1.5 J	5 U	5 U
ZINC	NC	2400	170	2400	6.9 J	9.4	10	3.9 J	6.4	8.6	10
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)											
2-METHYLNAPHTHALENE	NC	260	19	260	0.5 U	0.5 U	0.5 U	24 J	43	42	33
ACENAPHTHENE	NC	1300	38	1300	0.5 U	0.031 J	0.5 U	6 J	14	10	7.7 J
ACENAPHTHYLENE	NC	52	ID	52	0.5 U	0.5 U	0.5 U	1.7 J	3.8 J	3.7 J	2.6 J
ANTHRACENE	NC	43	ID	43	0.5 U	0.5 U	0.5 U	3.8 J	4.8 J	3.1 J	2.2 J
BENZO(A)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.051 J	0.28 J	1.3 J	1.2 J	10 U
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.5 U	0.5 UJ	1 J	10 U	10 U
BENZO(B)FLUORANTHENE	NC	1.5	ID	1.5	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.1 J	0.05 J	12 U	10 U	10 U
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.041 J	0.1 J	12 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U
FLUORANTHENE	NC	210	1.6	210	0.5 U	0.5 U	0.5 U	0.52 J	1.5 J	1 J	0.81 J
FLUORENE	NC	880	12	880	0.5 U	0.5 U	0.5 U	3.5 J	13	24	19
INDENO(1,2,3-CD)PYRENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U
NAPHTHALENE	NC	520	11	520	0.5 U	0.5 U	0.5 U	120	170	170	130
PHENANTHRENE	NC	52	2	52	0.5 U	0.5 U	0.5 U	6.8 J	11 J	11	8.3 J
PYRENE	NC	140	ID	140	0.5 U	0.5 U	0.5 U	0.39 J	1.5 J	1 J	10 U

1 - For comparison only.
J - Estimated Concentration.
U - Below detection limit at detection limit shown.
D - Duplicate sample
Shaded cell indicates concentration greater than selected criterion.
bgs - Below ground surface.
GSI - Groundwater-surface water interface
ID - Insufficient data to develop criterion.
MCL - Maximum Contaminant Level.
NC - No criterion.
PAHs - Polynuclear aromatic hydrocarbons.
RBSL - Risk-Based Screening Level

TABLE 2

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR SEPTEMBER 2011 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 2 OF 2

LOCATION	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	DAMW03					DAMW04		
SAMPLE DATE					6/6/2011	6/6/2011-D	9/14/2011	9/14/2011-D	12/16/2011	6/6/2011	9/14/2011	12/16/2011
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)												
ARSENIC	10	10	10	10	2.7 J	2.7 J	4.3 J	4.1 J	1.3 J	3 J	3.6 J	1.2 J
BARIUM	2000	2000	670	2000	310 J	300 J	370	360	310	150 J	210	130
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHROMIUM	100	100	100	100	0.21 J	1 U	0.22 J	0.23 J	1 U	1 U	1 U	0.23 J
COPPER	1300	1000	13	1300	1 U	1 U	1 U	0.15 J	0.25 J	0.88 J	0.6 J	0.32 J
LEAD	15	2	14	15	1 U	1 U	1 U	1 U	1 U	0.44 J	0.45 J	0.17 J
SELENIUM	50	50	5	50	5 UJ	5 UJ	0.97 J	0.96 J	0.5 U	5 UJ	5 UJ	0.5 U
ZINC	NC	2400	170	2400	4.2 J	3.9 J	5.5	5 U	7.7 U	110	100	100
METALS (UG/L)												
ARSENIC	10	10	10	10	2.6 J	2.5 J	4.8 J	4.4 J	1.3 J	3 J	3.8 J	1.1 J
BARIUM	2000	2000	670	2000	290	290	370	340	300	150	210	130
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.37 U	1.1 J	0.051 J	0.2 U	0.2 U	0.091 J
CHROMIUM	100	100	100	100	0.29 J	0.27 J	0.24 J	0.24 J	0.22 J	0.36 J	1 U	1 U
COPPER	1300	1000	13	1300	0.77 J	1 U	0.3 J	0.37 J	0.39 J	2.6	1.8	0.64 J
LEAD	15	2	14	15	0.47 J	0.33 J	0.7 J	0.57 J	1.2	2.1	3.3	1.8
SELENIUM	50	50	5	50	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 UJ	5 UJ	5 U
ZINC	NC	2400	170	2400	8.5 J	4.6 J	10	8.4	8.4	110 J	120	110
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)												
2-METHYLNAPHTHALENE	NC	260	19	260	0.07 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACENAPHTHENE	NC	1300	38	1300	1.6	1.6	2.6	2.9	1.5	0.05 J	0.03 J	0.5 U
ACENAPHTHYLENE	NC	52	ID	52	0.05 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ANTHRACENE	NC	43	ID	43	0.22 J	0.19 J	0.23 J	0.23 J	0.092 J	0.5 U	0.5 U	0.5 U
BENZO(A)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.072 J	0.051 J	0.041 J	0.5 U	0.5 U	0.19 J
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.052 J	0.5 U	0.5 U	0.5 U	0.5 U	0.24 J
BENZO(B)FLUORANTHENE	NC	1.5	ID	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.27 J
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J
DIBENZO(A,H)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J
FLUORANTHENE	NC	210	1.6	210	0.2 J	0.15 J	0.27 J	0.23 J	0.11 J	0.5 U	0.5 U	0.04 J
FLUORENE	NC	880	12	880	0.36 J	0.27 J	0.19 J	0.28 J	0.13 J	0.5 U	0.5 U	0.5 U
INDENO(1,2,3-CD)PYRENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J
NAPHTHALENE	NC	520	11	520	0.19 J	0.11 J	0.062 J	0.5 U	0.5 U	0.05 J	0.5 U	0.5 U
PHENANTHRENE	NC	52	2	52	1.2	1	1.4	1.5	0.6	0.05 J	0.5 U	0.5 U
PYRENE	NC	140	ID	140	0.15 J	0.13 J	0.23 J	0.24 J	0.1 J	0.04 J	0.5 U	0.061 J

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J - Estimated Concentration.
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Shaded cell indicates concentration greater than selected criterion.
bgs - Below ground surface.
GSI - Groundwater-surface water interface
ID - Insufficient data to develop criterion.
MCL - Maximum Contaminant Level.
NC - No criterion.
PAHs - Polynuclear aromatic hydrocarbons.
RBSL - Risk-Based Screening Level

ATTACHMENT A
FIELD FORMS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DA-GW01-1211
Sample Location: MW01
Sampled By: SEH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 12/16/11	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Time: 1320								
Method: LF	Clear	6.83	1.08	9.49	8.84	0.0	0.3	-204

PURGE DATA:

Date: 12/16/11	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: LF								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD):								
Static Water Level (WL): 1.0								
One Casing Volume(gal/L):								
Start Purge (hrs): 1320								
End Purge (hrs): 1320								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 2								

See Low Flow Sheet

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	4°C	2- 1L Amber	X
Total - Michigan 10 metals	HNO_3	1 - 250 mL Plastic	X
Dissolved - Michigan 10 metals	HNO_3	1 - 250mL Plastic	X

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Detroit Atwater
PROJECT NUMBER: 11dG02435
WELL ID.: PA-MW01
DATE: 12/16/11

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1230	1.0	Start purge								
1240	1.1	200	6.70	1.09	7.2	0.44	7.55	-192	0.3	
1250	1.12	200	6.58	1.03	4.2	0.0	7.73	-202	0.3	
1300	1.12	200	6.56	1.28	5.61	0.03	9.51	-201	0.3	
1305	1.12	200	6.83	1.05	3.31	0.0	9.41	-201	0.3	
1310	1.12	200	6.84	1.08	7.35	0.0	9.36	-204	0.3	
1315	1.12	200	6.83	1.08	3.31	0.0	9.49	-204	0.3	2 gals purged
1320	collect sample									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 120D2435

Sample ID No.: DA-GW02-1211
Sample Location: MW02
Sampled By: SEH
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 12/14/11	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Time: 1505								
Method: LF	clear	7.01	1.48	10.35	1.24	0.0	0.4	-294

PURGE DATA:

Date: 12/14/11	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: LF								
Monitor Reading (ppm):			See log sheet					
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD):								
Static Water Level (WL): 3.2								
One Casing Volume(gal/L):								
Start Purge (hrs): 1355								
End Purge (hrs): 1505								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 3 gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	4°C	2 - ~~4~~ 1L Amber	X
Total - Michigan 10 metals	HNO_3	1 - 250mL Plastic	X
Dissolved - Michigan 10 metals	HNO_3		X

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD: —

Duplicate ID No.: DA-GW-DUP-121611

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Detroit Athwater **WELL ID.:** DA-MW02
PROJECT NUMBER: 112G02435 **DATE:** 12/16/11

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or (ppt)	Comments
1355	3.2	Start purge								
1400	3.48	200	8.10	1.39	3.27	0.60	10.23	-268	0.4	small black particles in purge water & sulfur (?)
1410	3.65	200	8.12	1.38	2.73	0.00	10.27	-275	0.4	
1420	3.85	200	7.85	1.39	1.51	0.0	10.35	-295	0.4	odor
1430	3.87	175	7.75	1.42	1.46	0.0	10.31	-300	0.4	turn down pump
1440	3.88	175	7.69	1.41	1.05	0.0	10.35	-301	0.4	
1450	3.87	175	7.61	1.46	0.78	0.00	10.39	-297	0.4	no black particles
1500	3.87	175	7.61	1.48	1.24	0.0	10.35	-294	0.4	
1505	collect sample									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.:

Sample ID No.: DAGW-3-1211
Sample Location: Detroit Atwater
Sampled By: JRK
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 12-16-11 / Time: 1509 / Method: Low Flow	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
	Clear	6.53	1.06	10.57	4.54	0.00	0.0	-74

PURGE DATA:

Date: 12-16-11	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: 2"			see Purge Sheet					
Total Well Depth (TD): 13.28								
Static Water Level (WL): 4.65								
One Casing Volume(gal/L): 1.5gL								
Start Purge (hrs): 1430								
End Purge (hrs): 1500								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 10.5L								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	NA	(2)1L Amber	✓
Total - Michigan 10 metals	HNO3	(1)500 mL Plastic	✓
Dissolved - Michigan 10 metals	HNO3	(1)500 mL Plastic	✓

OBSERVATIONS / NOTES:

No tubing in well
Well was slightly turbid @ start

Sampled @ 1500

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Detroit Atwater
PROJECT NUMBER:
WELL ID.: DAGW-3-1211
DATE: 12-16-11

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1430	4.65	300	6.65	0.979	73.3	1.13	7.35	-15	0.0	
1435	4.07	4	6.56	1.07	35.7	0.00	10.58	-62	0.0	
1440	4.09	"	6.54	1.07	14.6	0.00	10.64	-66	0.0	
1445	4.09	"	6.53	1.06	11.55	0.00	10.52	-70	0.0	
1450	4.09	"	6.53	1.06	7.30	0.00	10.55	-72	0.0	
1455	4.09	"	6.53	1.06	4.93	0.00	10.57	-74	0.0	
1500	4.09	"	6.53	1.06	4.54	0.00	10.57	-74	0.0	

SIGNATURE(S):

Sampled @ 1505
1500 DUP

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112602435

Sample ID No.: DAGW-4-1211
Sample Location: Detroit Atwater
Sampled By: JRK
C.O.C. No.:
Type of Sample:
[] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 12-16-11	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1320	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	ORP
Method: Low Flow	Clear	6.71	0.710	11.04	3.58	0.00	0.0	

PURGE DATA:

Date: 12-16-11	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: 2"				See Purge Sheet				
Total Well Depth (TD): 13.15								
Static Water Level (WL): 2.54								
One Casing Volume(gal/L): 1.725								
Start Purge (hrs): 1250								
End Purge (hrs): 1320								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 10.5L								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	NA	(2) 1L Amber	✓
Total - Michigan 10 metals	HNO3	(1) 500m Plastic	✓
Dissolved - Michigan 10 metals	HNO3	(1) 500mL Plastic	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD ✓ Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Detroit Atwater
PROJECT NUMBER: 112G02455
WELL ID.: DAGW-04-1211
DATE: 12-16-11

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1250	2.54	500mL	8.45	0.609	58.8	9.84	12.26	13	0.0	
1255	2.68	"	6.83	0.740	6.87	0.00	11.21	-4	0.0	
1300	2.73	"	6.73	0.715	4.32	0.00	11.11	-21	0.0	
1305	2.74	"	6.71	0.713	4.25	0.00	11.02	-24	0.0	
1310	2.75	"	6.71	0.710	3.73	0.00	11.00	-24	0.0	
1315	2.75	"	6.71	0.708	3.45	0.00	11.01	-24	0.0	
1320	2.75	"	6.71	0.710	3.58	0.00	11.04	-24	0.0	

TP-1315

SIGNATURE(S):

Sampled PS2S MS/MSD taken Here
JLL
1320

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Detroit Arsenic **Project No.:** 112G02435
Location: Detroit, MI **Personnel:** S Hill, J. King
Weather Conditions: Cold, Overcast **Measuring Device:** Heron
Tidally Influenced: Yes ___ No X **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
DA-MW01	12/14				1.00			
DA-MW02	↓				~~6.532~~			
DA-MW03					4.08			
DA-MW04					2.49			
river					4.2			

* All measurements to the nearest 0.01 foot

ATTACHMENT B
DISPOSAL MANIFEST

008255879JJK

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MI2 890 306 471	1	(313) 347-1300	008255879 JJK

GENERATOR

5. Generator's Name and Mailing Address
USCG SECTOR DETROIT
C/O EARTH SMART ENV.
525 E. MICHIGAN AVE. #124
SALINE, MI 48176
Generator's Phone: (313) 568-9551

Generator's Site Address (if different than mailing address)
UNITED STATES COAST GUARD
2660 EAST ATWATER STREET
DETROIT, MI 48207

6. Transporter 1 Company Name
EQ INDUSTRIAL SERVICES

U.S. EPA ID Number
MID 000 283 871

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
EQ DETROIT, INC.
1923 FREDERICK
DETROIT, MI 48211
Facility's Phone: (313) 347-1300

U.S. EPA ID Number
MID 980 991 566

No.	9a. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. Non Hazardous Liquid Waste, Not Dot Not RCRA Regulated	001	DM	30	G	029L		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. P107184DET / Non Haz IDW Liquids (1x55)

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: JASON L STEELSON
Signature: Jason L Steelson
Month: 1 Day: 23 Year: 12

INTL

16. International Shipments ☐ Import to U.S. ☐ Export from U.S.
Transporter signature (for exports only):
Port of entry/exit:
Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Scott Belasco
Signature: Scott Belasco
Month: 1 Day: 23 Year: 12

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
LIW			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Tammy J. Thrkle
Signature: Tammy J. Thrkle
Month: 1 Day: 23 Year: 12

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

CERTIFICATE OF MANAGEMENT

This Certificate is to verify that the wastes specified on the following manifest(s) have been properly received and will be properly managed to meet all applicable local, state, and federal regulations.

Generator Name:	United States Coast Guard	
Manifest/BOL Number:	008255879JJK	
Approval Number(s):	F107164DET	

FACILITY NAME: EQ DETROIT, INC.
EPA ID#:MID980991566

ADDRESS: 1923 Frederick

PHONE NUMBER: 313-347-1300
FAX NUMBER: 313.923.3375

AUTHORIZED SIGNATURE: Brett Lee on behalf of EQ Detroit

ATTACHMENT C
LABORATORY REPORTS

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW04-1211**	Sampled:	12/16/11 13:20
Lab Sample ID:	**1112301-01**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00
Unit:	ug/L	Prepared:	12/20/11 By: SKA
Dilution Factor:	1	Analyzed:	12/30/11 By: DWJ
QC Batch:	1114405	Analytical Batch:	2A03043

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.50U	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.19J**	0.50	0.032
*50-32-8	Benzo(a)pyrene	**0.24J**	0.50	0.029
205-99-2	Benzo(b)fluoranthene	**0.22J**	0.50	0.068
207-08-9	Benzo(k)fluoranthene	**0.27J**	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	**0.22J**	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	**0.14J**	0.50	0.12
206-44-0	Fluoranthene	**0.040J**	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
*193-39-5	Indeno(1,2,3-cd)pyrene	**0.14J**	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	**0.061J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
2-Fluorophenol	*32*	*20-110*
Phenol-d6	*20*	*10-115*
Nitrobenzene-d5	*60*	*40-110*
2-Fluorobiphenyl	*57*	*50-110*
2,4,6-Tribromophenol	*50*	*40-125*
o-Terphenyl	*66*	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW04-1211**	Sampled:	12/16/11 13:20
Lab Sample ID:	**1112301-01**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.2**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
Barium	**130**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:44	MSM	1114387
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
Chromium	**0.23**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
Copper	**0.32**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
Lead	**0.17**	**J**	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 12:41	DSC	1114635
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 12:02	MSM	1114387
***Zinc**	**100**	**B**	25	19	ug/L	5	USEPA-6020A	12/23/11 12:44	MSM	1114387

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW04-1211**	Sampled:	12/16/11 13:20
Lab Sample ID:	**1112301-01**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.1**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
Barium	**130**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:28	MSM	1114388
Cadmium	**0.091**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
Copper	**0.64**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
Lead	**1.8**		1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 10:48	DSC	1114632
Selenium	**0.90**	**J**	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 11:34	MSM	1114388
***Zinc**	**110**		25	19	ug/L	5	USEPA-6020A	12/23/11 12:28	MSM	1114388

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW01-1211**	Sampled:	12/16/11 13:20
Lab Sample ID:	**1112301-02**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00
Unit:	ug/L	Prepared:	12/20/11 By: SKA
Dilution Factor:	1	Analyzed:	12/31/11 By: DWJ
QC Batch:	1114405	Analytical Batch:	2A03043

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.50U	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.051J**	0.50	0.032
*50-32-8	Benzo(a)pyrene	**0.092J**	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	**0.10J**	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	**0.041J**	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
*193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	0.50U	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
2-Fluorophenol	*35*	*20-110*
Phenol-d6	*21*	*10-115*
Nitrobenzene-d5	*62*	*40-110*
2-Fluorobiphenyl	*53*	*50-110*
2,4,6-Tribromophenol	*57*	*40-125*
o-Terphenyl	*67*	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW01-1211**	Sampled:	12/16/11 13:20
Lab Sample ID:	**1112301-02**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.36**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
Barium	**260**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:49	MSM	1114387
Cadmium	**0.14**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
Copper	**0.28**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 12:56	DSC	1114635
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387
***Zinc**	**6.5**	**B**	5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 12:11	MSM	1114387

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW01-1211**	Sampled:	12/16/11 13:20
Lab Sample ID:	**1112301-02**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.52**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Barium	**260**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:34	MSM	1114388
Cadmium	**0.79**		0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Chromium	**0.57**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Copper	**0.98**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Lead	**0.63**	**J**	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 11:03	DSC	1114632
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388
Zinc	**10**		5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 11:43	MSM	1114388

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW03-1211**	Sampled:	12/16/11 15:00
Lab Sample ID:	**1112301-03**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00
Unit:	ug/L	Prepared:	12/20/11 By: SKA
Dilution Factor:	1	Analyzed:	12/31/11 By: DWJ
QC Batch:	1114405	Analytical Batch:	2A03043

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**1.5**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	**0.092J**	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.041J**	0.50	0.032
*50-32-8	Benzo(a)pyrene	**0.041J**	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.11J**	0.50	0.033
86-73-7	Fluorene	**0.13J**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	**0.60**	0.50	0.035
129-00-0	Pyrene	**0.10J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
2-Fluorophenol	*35*	*20-110*
Phenol-d6	*22*	*10-115*
Nitrobenzene-d5	*59*	*40-110*
2-Fluorobiphenyl	***48***	*50-110*
2,4,6-Tribromophenol	*59*	*40-125*
o-Terphenyl	*65*	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW03-1211**	Sampled:	12/16/11 15:00
Lab Sample ID:	**1112301-03**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.3**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
Barium	**310**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:50	MSM	1114387
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
Copper	**0.25**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 13:01	DSC	1114635
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387
***Zinc**	**7.7**	**B**	5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 12:17	MSM	1114387

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW03-1211**	Sampled:	12/16/11 15:00
Lab Sample ID:	**1112301-03**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**1.3**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Barium	**300**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:35	MSM	1114388
Cadmium	**0.051**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Chromium	**0.22**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Copper	**0.39**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Lead	**1.2**		1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 11:08	DSC	1114632
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388
Zinc	**8.4**		5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 11:45	MSM	1114388

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW02-1211**	Sampled:	12/16/11 15:05
Lab Sample ID:	**1112301-04**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00
Unit:	ug/L	Prepared:	12/20/11 By: SKA
Dilution Factor:	20	Analyzed:	01/05/12 By: JLB
QC Batch:	1114405	Analytical Batch:	2A06008

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**10**	10	0.58
208-96-8	Acenaphthylene	**3.7J**	10	0.72
120-12-7	Anthracene	**3.1J**	10	0.76
56-55-3	Benzo(a)anthracene	**1.2J**	10	0.64
50-32-8	Benzo(a)pyrene	10U	10	0.59
205-99-2	Benzo(b)fluoranthene	10U	10	1.4
207-08-9	Benzo(k)fluoranthene	10U	10	0.79
191-24-2	Benzo(g,h,i)perylene	10U	10	5.5
218-01-9	Chrysene	10U	10	0.71
53-70-3	Dibenz(a,h)anthracene	10U	10	2.3
206-44-0	Fluoranthene	**1.0J**	10	0.65
86-73-7	Fluorene	**24**	10	0.88
193-39-5	Indeno(1,2,3-cd)pyrene	10U	10	2.2
91-57-6	2-Methylnaphthalene	**42**	10	0.72
91-20-3	Naphthalene	**170**	10	0.61
85-01-8	Phenanthrene	**11**	10	0.69
129-00-0	Pyrene	**1.0J**	10	0.75

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW02-1211**	Sampled:	12/16/11 15:05
Lab Sample ID:	**1112301-04**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**9.3**		5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
Barium	**110**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:52	MSM	1114387
Cadmium	**0.058**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
Chromium	**0.36**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
Copper	1.0	U	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 13:07	DSC	1114635
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387
***Zinc**	**6.9**	**B**	5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 12:19	MSM	1114387

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW02-1211**	Sampled:	12/16/11 15:05
Lab Sample ID:	**1112301-04**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**9.5**		5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Barium	**110**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:36	MSM	1114388
Cadmium	**0.73**		0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Chromium	**0.39**	J	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Copper	**0.19**	J	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Lead	**0.16**	J	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 11:13	DSC	1114632
Selenium	**1.3**	J	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388
Zinc	**8.6**		5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 11:47	MSM	1114388

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-DUP-1211**	Sampled:	12/16/11 00:00
Lab Sample ID:	**1112301-05**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00
Unit:	ug/L	Prepared:	12/20/11 By: SKA
Dilution Factor:	20	Analyzed:	01/06/12 By: JLB
QC Batch:	1114405	Analytical Batch:	2A06028

*Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**7.7J**	10	0.58
208-96-8	Acenaphthylene	**2.6J**	10	0.72
120-12-7	Anthracene	**2.2J**	10	0.76
56-55-3	Benzo(a)anthracene	10U	10	0.64
50-32-8	Benzo(a)pyrene	10U	10	0.59
205-99-2	Benzo(b)fluoranthene	10U	10	1.4
207-08-9	Benzo(k)fluoranthene	10U	10	0.79
191-24-2	Benzo(g,h,i)perylene	10U	10	5.5
218-01-9	Chrysene	10U	10	0.71
53-70-3	Dibenz(a,h)anthracene	10U	10	2.3
206-44-0	Fluoranthene	**0.81J**	10	0.65
86-73-7	Fluorene	**19**	10	0.88
193-39-5	Indeno(1,2,3-cd)pyrene	10U	10	2.2
91-57-6	2-Methylnaphthalene	**33**	10	0.72
91-20-3	Naphthalene	**130**	10	0.61
85-01-8	Phenanthrene	**8.3J**	10	0.69
129-00-0	Pyrene	10U	10	0.75

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-DUP-1211**	Sampled:	12/16/11 00:00
Lab Sample ID:	**1112301-05**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**9.2**		5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
Barium	**100**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:53	MSM	1114387
Cadmium	**0.046**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
Chromium	**0.37**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
Copper	**0.28**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 13:12	DSC	1114635
Selenium	**1.1**	**J**	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387
***Zinc**	**7.8**	**B**	5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 12:21	MSM	1114387

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1112301**
Project:	USCG Atwater Facility	Description:	Laboratory Services
Client Sample ID:	**DA-GW-DUP-1211**	Sampled:	12/16/11 00:00
Lab Sample ID:	**1112301-05**	Sampled By:	Tetra Tech
Matrix:	Water	Received:	12/17/11 09:00

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**10**		5.0	0.18	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Barium	**110**		10	0.68	ug/L	5	USEPA-6020A	12/23/11 12:37	MSM	1114388
Cadmium	**0.054**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Chromium	**0.38**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Copper	**0.39**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Lead	**0.23**	**J**	1.0	0.15	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	12/29/11 11:18	DSC	1114632
Selenium	5.0	U	5.0	0.78	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388
Zinc	**10**		5.0	3.8	ug/L	1	USEPA-6020A	12/23/11 11:56	MSM	1114388

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QUALITY CONTROL REPORT

Semivolatile Organic Compounds by EPA Method 8270C

Analyte	Sample Conc.	Spike Qty.	Result	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
QC Batch: 1114405 3510C Liquid-Liquid Extraction/USEPA-8270C									
Method Blank					Analyzed:	12/30/2011	By: DWJ		
Unit: ug/L					Analytical Batch:	2A03043			
Acenaphthene			0.50 U					0.50	0.029
Acenaphthylene			0.50 U					0.50	0.036
Anthracene			0.50 U					0.50	0.038
Benzo(a)anthracene			0.50 U			--		0.50	0.032
Benzo(a)pyrene			**0.030 J**			--		0.50	0.029
Benzo(b)fluoranthene			0.50 U			--		0.50	0.068
Benzo(k)fluoranthene			0.50 U			--		0.50	0.040
Benzo(g,h,i)perylene			0.50 U			--		0.50	0.27
Chrysene			0.50 U			--		0.50	0.036
Dibenz(a,h)anthracene			0.50 U			--		0.50	0.12
Fluoranthene			0.50 U			--		0.50	0.033
Fluorene			0.50 U					0.50	0.044
Indeno(1,2,3-cd)pyrene			0.50 U			--		0.50	0.11
2-Methylnaphthalene			0.50 U					0.50	0.036
Naphthalene			0.50 U					0.50	0.031
Phenanthrene			0.50 U			--		0.50	0.035
Pyrene			0.50 U			--		0.50	0.038
Surrogates:									
2-Fluorophenol				*47*	*20-110*				
Phenol-d6				*30*	*10-115*				
Nitrobenzene-d5				*73*	*40-110*				
2-Fluorobiphenyl				*72*	*50-110*				
2,4,6-Tribromophenol				*57*	*40-125*				
o-Terphenyl				*81*	*50-135*				
Laboratory Control Sample					Analyzed:	12/30/2011	By: DWJ		
Unit: ug/L					Analytical Batch:	2A03043			
Acenaphthene	9.60		**6.54**	68	45-110	--	30	0.50	0.029
Acenaphthylene	9.60		**6.67**	69	50-105	--	30	0.50	0.036
Anthracene	9.60		**7.07**	74	55-110	--	30	0.50	0.038
Benzo(a)anthracene	9.60		**6.86**	71	55-110	--	30	0.50	0.032
Benzo(a)pyrene	9.60		**6.64**	69	55-110	--	30	0.50	0.029
Benzo(b)fluoranthene	9.60		**6.92**	72	45-120	--	30	0.50	0.068
Benzo(k)fluoranthene	9.60		**6.85**	71	45-125	--	30	0.50	0.040
Benzo(g,h,i)perylene	9.60		**5.98**	62	40-125	--	30	0.50	0.27
Chrysene	9.60		**7.08**	74	55-110	--	30	0.50	0.036

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Semivolatile Organic Compounds by EPA Method 8270C (Continued)

Analyte	Sample Conc.	Spike Qty.	Result	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
QC Batch: 1114405 (Continued) 3510C Liquid-Liquid Extraction/USEPA-8270C									
Laboratory Control Sample (Continued)					Analyzed:		12/30/2011	By: DWJ	
Unit: ug/L					Analytical Batch:		2A03043		
Dibenz(a,h)anthracene		9.60	**6.17**	64	40-125	--	30	0.50	0.12
Fluoranthene		9.60	**6.40**	67	55-115	--	30	0.50	0.033
Fluorene		9.60	**6.42**	67	50-110	--	30	0.50	0.044
Indeno(1,2,3-cd)pyrene		9.60	**5.96**	62	45-125	--	30	0.50	0.11
2-Methylnaphthalene		9.60	**6.60**	69	45-105	--	30	0.50	0.036
Naphthalene		9.60	**6.32**	66	40-100	--	30	0.50	0.031
Phenanthrene		9.60	**6.66**	69	50-115	--	30	0.50	0.035
Pyrene		9.60	**7.31**	76	50-130	--	30	0.50	0.038
Surrogates:									
2-Fluorophenol				*39*	*20-110*				
Phenol-d6				*25*	*10-115*				
Nitrobenzene-d5				*61*	*40-110*				
2-Fluorobiphenyl				*64*	*50-110*				
2,4,6-Tribromophenol				*59*	*40-125*				
o-Terphenyl				*70*	*50-135*				
Matrix Spike 1112301-01 DA-GW04-1211					Analyzed:		12/31/2011	By: DWJ	
Unit: ug/L					Analytical Batch:		2A03043		
Acenaphthene	0.50 U	9.70	**6.55**	68	45-110	--	30	0.50	0.029
Acenaphthylene	0.50 U	9.70	**6.62**	68	50-105	--	30	0.50	0.036
Anthracene	0.50 U	9.70	**7.05**	73	55-110	--	30	0.50	0.038
Benzo(a)anthracene	0.192 J	9.70	**6.73**	67	55-110	--	30	0.50	0.032
Benzo(a)pyrene	0.242 J	9.70	**6.66**	66	55-110	--	30	0.50	0.029
Benzo(b)fluoranthene	0.222 J	9.70	**7.10**	71	45-120	--	30	0.50	0.068
Benzo(k)fluoranthene	0.273 J	9.70	**7.14**	71	45-125	--	30	0.50	0.040
Benzo(g,h,i)perylene	0.50 U	9.70	**5.27**	54	40-125	--	30	0.50	0.27
Chrysene	0.222 J	9.70	**6.91**	69	55-110	--	30	0.50	0.036
Dibenz(a,h)anthracene	0.141 J	9.70	**5.72**	58	40-125	--	30	0.50	0.12
Fluoranthene	0.0404	9.70	**6.34**	65	55-115	--	30	0.50	0.033
Fluorene	0.50 U	9.70	**6.41**	66	50-110	--	30	0.50	0.044
Indeno(1,2,3-cd)pyrene	0.141 J	9.70	**5.66**	57	45-125	--	30	0.50	0.11
2-Methylnaphthalene	0.50 U	9.70	**6.64**	68	45-105	--	30	0.50	0.036
Naphthalene	0.50 U	9.70	**6.28**	65	40-100	--	30	0.50	0.031
Phenanthrene	0.50 U	9.70	**6.67**	69	50-115	--	30	0.50	0.035
Pyrene	0.0606	9.70	**8.02**	82	50-130	--	30	0.50	0.038
Surrogates:									
2-Fluorophenol				*34*	*20-110*				

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Semivolatile Organic Compounds by EPA Method 8270C (Continued)

Analyte	Sample Conc.	Spike Qty.	Result	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL

QC Batch: 1114405 (Continued) 3510C Liquid-Liquid Extraction/USEPA-8270C

Matrix Spike (Continued) 1112301-01 DA-GW04-1211 Analyzed: 12/31/2011 By: DWJ
Unit: ug/L Analytical Batch: 2A03043

Surrogates (Continued):									
Phenol-d6				*22*	*10-115*				
Nitrobenzene-d5				*60*	*40-110*				
2-Fluorobiphenyl				*63*	*50-110*				
2,4,6-Tribromophenol				*63*	*40-125*				
o-Terphenyl				*68*	*50-135*				

Matrix Spike Duplicate 1112301-01 DA-GW04-1211 Analyzed: 12/31/2011 By: DWJ
Unit: ug/L Analytical Batch: 2A03043

Acenaphthene	0.50 U	9.90	**6.08**	61	45-110	7	30	0.50	0.029
Acenaphthylene	0.50 U	9.90	**6.18**	62	50-105	7	30	0.50	0.036
Anthracene	0.50 U	9.90	**6.61**	67	55-110	6	30	0.50	0.038
Benzo(a)anthracene	0.192 J	9.90	**6.11**	60	55-110	10	30	0.50	0.032
Benzo(a)pyrene	0.242 J	9.90	**6.34**	62	55-110	5	30	0.50	0.029
Benzo(b)fluoranthene	0.222 J	9.90	**6.68**	65	45-120	6	30	0.50	0.068
Benzo(k)fluoranthene	0.273 J	9.90	**6.75**	65	45-125	6	30	0.50	0.040
Benzo(g,h,i)perylene	0.50 U	9.90	**5.11**	52	40-125	3	30	0.50	0.27
Chrysene	0.222 J	9.90	**6.61**	65	55-110	4	30	0.50	0.036
Dibenz(a,h)anthracene	0.141 J	9.90	**5.44**	54	40-125	5	30	0.50	0.12
Fluoranthene	0.0404	9.90	**5.96**	60	55-115	6	30	0.50	0.033
Fluorene	0.50 U	9.90	**5.90**	60	50-110	8	30	0.50	0.044
Indeno(1,2,3-cd)pyrene	0.141 J	9.90	**5.28**	52	45-125	7	30	0.50	0.11
2-Methylnaphthalene	0.50 U	9.90	**5.94**	60	45-105	11	30	0.50	0.036
Naphthalene	0.50 U	9.90	**5.80**	59	40-100	8	30	0.50	0.031
Phenanthrene	0.50 U	9.90	**6.18**	62	50-115	8	30	0.50	0.035
Pyrene	0.0606	9.90	**7.35**	74	50-130	9	30	0.50	0.038
Surrogates:									
2-Fluorophenol				*30*	*20-110*				
Phenol-d6				*24*	*10-115*				
Nitrobenzene-d5				*52*	*40-110*				
2-Fluorobiphenyl				*56*	*50-110*				
2,4,6-Tribromophenol				*56*	*40-125*				
o-Terphenyl				*62*	*50-135*				

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QUALITY CONTROL REPORT

Dissolved Metals by EPA 6000/7000 Series Methods

QC Type	Sample Conc.	Spike Qty.	Result	Unit	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
Analyte: Arsenic/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			5.0 U	ug/L					5.0	0.18
Laboratory Control Sample		50.0	**49.1**	ug/L	98	80-120		20	5.0	0.18
1112301-01 [DA-GW04-1211]										
Matrix Spike	1.18	50.0	**51.1**	ug/L	100	80-120		20	5.0	0.18
Matrix Spike Duplicate	1.18	50.0	**46.6**	ug/L	91	80-120	9	20	5.0	0.18
Analyte: Barium/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			2.0 U	ug/L					2.0	0.14
Laboratory Control Sample		50.0	**48.6**	ug/L	97	80-120		20	2.0	0.14
1112301-01 [DA-GW04-1211]										
Matrix Spike	126	50.0	**175**	ug/L	96	80-120		20	10	0.68
Matrix Spike Duplicate	126	50.0	**168**	ug/L	84	80-120	4	20	10	0.68
Analyte: Cadmium/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			0.20 U	ug/L					0.20	0.038
Laboratory Control Sample		50.0	**47.4**	ug/L	95	80-120		20	0.20	0.038
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	50.0	**51.2**	ug/L	102	80-120		20	0.20	0.038
Matrix Spike Duplicate	<RL	50.0	**44.5**	ug/L	89	80-120	14	20	0.20	0.038
Analyte: Chromium/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			1.0 U	ug/L					1.0	0.20
Laboratory Control Sample		50.0	**49.5**	ug/L	99	80-120		20	1.0	0.20
1112301-01 [DA-GW04-1211]										
Matrix Spike	0.226	50.0	**48.9**	ug/L	97	80-120		20	1.0	0.20
Matrix Spike Duplicate	0.226	50.0	**43.8**	ug/L	87	80-120	11	20	1.0	0.20
Analyte: Copper/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			1.0 U	ug/L					1.0	0.13

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QUALITY CONTROL REPORT

Dissolved Metals by EPA 6000/7000 Series Methods (Continued)

QC Type	Sample Conc.	Spike Qty.	Result	Unit	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
Analyte: Copper/USEPA-6020A (Continued)										
QC Batch: 1114387 (Continued) (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Laboratory Control Sample		50.0	**49.9**	ug/L	100	80-120		20	1.0	0.13
1112301-01 [DA-GW04-1211]										
Matrix Spike	0.320	50.0	**46.4**	ug/L	92	80-120		20	1.0	0.13
Matrix Spike Duplicate	0.320	50.0	**41.1**	ug/L	82	80-120	12	20	1.0	0.13
Analyte: Lead/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			1.0 U	ug/L					1.0	0.15
Laboratory Control Sample		50.0	**49.3**	ug/L	99	80-120		20	1.0	0.15
1112301-01 [DA-GW04-1211]										
Matrix Spike	0.175	50.0	**49.4**	ug/L	99	80-120		20	1.0	0.15
Matrix Spike Duplicate	0.175	50.0	**43.5**	ug/L	87	80-120	13	20	1.0	0.15
Analyte: Mercury/USEPA-7470A										
QC Batch: 1114635 (7470A Digestion - Dissolved)								Analyzed: 12/29/2011	By: DSC	
Method Blank			0.20 U	ug/L					0.20	0.055
Laboratory Control Sample		2.00	**2.03**	ug/L	102	80-120		20	0.20	0.055
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	2.00	**2.05**	ug/L	103	80-120		20	0.20	0.0
Matrix Spike Duplicate	<RL	2.00	**2.06**	ug/L	103	80-120	0.4	20	0.20	0.055
Analyte: Selenium/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			5.0 U	ug/L					5.0	0.78
Laboratory Control Sample		50.0	**47.2**	ug/L	94	80-120		20	5.0	0.78
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	50.0	**48.4**	ug/L	97	80-120		20	5.0	0.78
Matrix Spike Duplicate	<RL	50.0	**45.2**	ug/L	90	80-120	7	20	5.0	0.78
Analyte: Silver/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)								Analyzed: 12/23/2011	By: MSM	
Method Blank			0.50 U	ug/L					0.50	0.037

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QUALITY CONTROL REPORT

Dissolved Metals by EPA 6000/7000 Series Methods (Continued)

QC Type	Sample Conc.	Spike Qty.	Result	Unit	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
Analyte: **Silver**/USEPA-6020A (Continued)										
QC Batch: 1114387 (Continued) (General Metals Prep)							Analyzed: 12/23/2011		By: MSM	
Laboratory Control Sample		50.0	**49.1**	ug/L	98	80-120		20	0.50	0.037
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	50.0	**41.4**	ug/L	83	80-120		20	0.50	0.037
Matrix Spike Duplicate	<RL	50.0	**42.3**	ug/L	85	80-120	2	20	0.50	0.037
Analyte: **Zinc**/USEPA-6020A										
QC Batch: 1114387 (General Metals Prep)							Analyzed: 12/23/2011		By: MSM	
Method Blank			**4.9 J**	ug/L					5.0	3.8
*Laboratory Control Sample		50.0	**52.9 B**	ug/L	106	80-120		20	5.0	3.8
1112301-01 [DA-GW04-1211]										
*Matrix Spike	103B	50.0	**143 B**	ug/L	80	80-120		20	25	19
*Matrix Spike Duplicate	103B	50.0	**161 B**	ug/L	117	80-120	12	20	25	19

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QUALITY CONTROL REPORT

Total Metals by EPA 6000/7000 Series Methods

QC Type	Sample Conc.	Spike Qty.	Result	Unit	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
Analyte: Arsenic/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)								Analyzed: 12/23/2011	By: MSM	
Method Blank			5.0 U	ug/L					5.0	0.18
Laboratory Control Sample		50.0	**47.7**	ug/L	95	80-120		20	5.0	0.18
1112301-01 [DA-GW04-1211]										
Matrix Spike	1.10	50.0	**49.8**	ug/L	97	80-120		20	5.0	0.18
Matrix Spike Duplicate	1.10	50.0	**51.3**	ug/L	100	80-120	3	20	5.0	0.18
Analyte: Barium/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)								Analyzed: 12/23/2011	By: MSM	
Method Blank			2.0 U	ug/L					2.0	0.14
Laboratory Control Sample		50.0	**49.2**	ug/L	98	80-120		20	2.0	0.14
1112301-01 [DA-GW04-1211]										
Matrix Spike	125	50.0	**178**	ug/L	106	80-120		20	10	0.68
Matrix Spike Duplicate	125	50.0	**173**	ug/L	95	80-120	3	20	10	0.68
Analyte: Cadmium/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)								Analyzed: 12/23/2011	By: MSM	
Method Blank			0.20 U	ug/L					0.20	0.038
Laboratory Control Sample		50.0	**47.6**	ug/L	95	80-120		20	0.20	0.038
1112301-01 [DA-GW04-1211]										
Matrix Spike	0.0906	50.0	**50.1**	ug/L	100	80-120		20	0.20	0.038
Matrix Spike Duplicate	0.0906	50.0	**49.7**	ug/L	99	80-120	0.8	20	0.20	0.038
Analyte: Chromium/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)								Analyzed: 12/23/2011	By: MSM	
Method Blank			1.0 U	ug/L					1.0	0.20
Laboratory Control Sample		50.0	**48.6**	ug/L	97	80-120		20	1.0	0.20
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	50.0	**50.1**	ug/L	100	80-120		20	1.0	0.20
Matrix Spike Duplicate	<RL	50.0	**51.5**	ug/L	103	80-120	3	20	1.0	0.20
Analyte: Copper/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)								Analyzed: 12/23/2011	By: MSM	
Method Blank			1.0 U	ug/L					1.0	0.13

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Total Metals by EPA 6000/7000 Series Methods (Continued)

QC Type	Sample Conc.	Spike Qty.	Result	Unit	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
Analyte: Copper/USEPA-6020A (Continued)										
QC Batch: 1114388 (Continued) (3020A Digestion)							Analyzed: 12/23/2011		By: MSM	
Laboratory Control Sample		50.0	**49.3**	ug/L	99	80-120		20	1.0	0.13
1112301-01 [DA-GW04-1211]										
Matrix Spike	0.643	50.0	**46.8**	ug/L	92	80-120		20	1.0	0.13
Matrix Spike Duplicate	0.643	50.0	**48.1**	ug/L	95	80-120	3	20	1.0	0.13
Analyte: Lead/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)							Analyzed: 12/23/2011		By: MSM	
Method Blank			1.0 U	ug/L					1.0	0.15
Laboratory Control Sample		50.0	**49.2**	ug/L	98	80-120		20	1.0	0.15
1112301-01 [DA-GW04-1211]										
Matrix Spike	1.76	50.0	**51.0**	ug/L	99	80-120		20	1.0	0.15
Matrix Spike Duplicate	1.76	50.0	**53.0**	ug/L	102	80-120	4	20	1.0	0.15
Analyte: Mercury/USEPA-7470A										
QC Batch: 1114632 (7470A Digestion - Total)							Analyzed: 12/29/2011		By: DSC	
Method Blank			0.20 U	ug/L					0.20	0.055
Laboratory Control Sample		2.00	**2.12**	ug/L	106	80-120		20	0.20	0.055
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	2.00	**2.16**	ug/L	108	80-120		20	0.20	0.055
Matrix Spike Duplicate	<RL	2.00	**2.17**	ug/L	109	80-120	0.6	20	0.20	0.055
Analyte: Selenium/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)							Analyzed: 12/23/2011		By: MSM	
Method Blank			**1.2 J**	ug/L					5.0	0.78
Laboratory Control Sample		50.0	**46.7**	ug/L	93	80-120		20	5.0	0.78
1112301-01 [DA-GW04-1211]										
Matrix Spike	0.904	50.0	**46.6**	ug/L	91	80-120		20	5.0	0.78
Matrix Spike Duplicate	0.904	50.0	**48.4**	ug/L	95	80-120	4	20	5.0	0.78
Analyte: Silver/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)							Analyzed: 12/23/2011		By: MSM	
Method Blank			0.50 U	ug/L					0.50	0.037

Continued on next page

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QUALITY CONTROL REPORT

Total Metals by EPA 6000/7000 Series Methods (Continued)

QC Type	Sample Conc.	Spike Qty.	Result	Unit	Spike % Rec.	Control Limits	RPD	RPD Limits	RL	MDL
Analyte: Silver/USEPA-6020A (Continued)										
QC Batch: 1114388 (Continued) (3020A Digestion)							Analyzed: 12/23/2011		By: MSM	
Laboratory Control Sample		50.0	**48.1**	ug/L	96	80-120		20	0.50	0.037
1112301-01 [DA-GW04-1211]										
Matrix Spike	<RL	50.0	**46.9**	ug/L	94	80-120		20	0.50	0.037
Matrix Spike Duplicate	<RL	50.0	**43.9**	ug/L	88	80-120	7	20	0.50	0.037
Analyte: Zinc/USEPA-6020A										
QC Batch: 1114388 (3020A Digestion)							Analyzed: 12/23/2011		By: MSM	
Method Blank			5.0 U	ug/L					5.0	3.8
Laboratory Control Sample		50.0	**50.2**	ug/L	100	80-120		20	5.0	3.8
1112301-01 [DA-GW04-1211]										
Matrix Spike	111	50.0	**158**	ug/L	94	80-120		20	25	19
Matrix Spike Duplicate	111	50.0	**155**	ug/L	87	80-120	2	20	25	19

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STATEMENT OF DATA QUALIFICATIONS

Semivolatile Organic Compounds by EPA Method 8270C

Qualification: Manual integration was performed on this sample for the analyte(s) listed below in accordance with the TriMatrix Manual Integration SOP. All necessary documentation, including the signed review, is included in the raw data section of the data package.

Analysis: USEPA-8270C

Sample/Analyte:	1112301-01	DA-GW04-1211	Indeno(1,2,3-cd)pyrene
	1112301-02	DA-GW01-1211	Indeno(1,2,3-cd)pyrene
	1112301-04	DA-GW02-1211	Naphthalene-d8
	1112301-05	DA-GW-DUP-1211	Naphthalene-d8

Qualification: The analyte concentration in the associated MB was greater than the MDL but less than the RL. The positive sample result, which was less than 5 times the MB value, is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:	1112301-01	DA-GW04-1211	Benzo(a)pyrene
	1112301-02	DA-GW01-1211	Benzo(a)pyrene
	1112301-03	DA-GW03-1211	Benzo(a)pyrene

Qualification: One or more surrogate recoveries in the GC/MS SVOC acid and/or base-neutral fraction(s) for the sample were less than the lower control limit but greater than or equal to 10%. All results from the same fraction are considered estimated.

Analysis: USEPA-8270C

Sample:	1112301-03	DA-GW03-1211

Qualification: Surrogate results are unavailable due to positive results in the sample, resulting in a dilution. Surrogate concentrations were diluted below the calibration range.

Analysis: USEPA-8270C

Sample:	1112301-04	DA-GW02-1211
	1112301-05	DA-GW-DUP-1211

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STATEMENT OF DATA QUALIFICATIONS

Dissolved Metals by EPA 6000/7000 Series Methods

Qualification: The analyte concentration in the associated MB was greater than or equal to 1/2 the LOQ. The positive sample result, which was greater than 10 times the MB value, is not considered estimated.

Analysis: USEPA-6020A

Sample/Analyte:		
1112301-01	DA-GW04-1211	Zinc

Qualification: The analyte concentration in the MB for this common lab contaminant was greater than 1/2 the LOQ, but less than the LOQ. The positive sample result, which was less than 10 times the MB value, is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte:		
1112301-02	DA-GW01-1211	Zinc
1112301-03	DA-GW03-1211	Zinc
1112301-04	DA-GW02-1211	Zinc
1112301-05	DA-GW-DUP-1211	Zinc

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TRIMATRIX LABORATORIES

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods

Qualification: This analyte was not present in this sample at a concentration greater than 100 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6020A

Sample/Analyte: 1112301-01 DA-GW04-1211 Zinc

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ATTACHMENT D
DATA VALIDATION REPORT
(on pdf)

DECEMBER 2011 DATA VALIDATION REPORT

DATA VALIDATION REPORT IS PROVIDED ON CD

MARCH 2012 REPORT

TETRA TECH
661 Andersen Drive ▪ Pittsburgh, Pennsylvania 15220-2745
(412) 921-7000 ▪ FAX (412) 921-4040 ▪ www.tetratech.com

PITT 05-12-001

May 4, 2012

Ms. Lynn M. Keller
Environmental Engineer
USCG Civil Engineering Unit
1240 East Ninth St., Rm. 2179
Cleveland, OH 44199-2060

Reference: Contract Number HSCG83-08-D-3CL109
Task Order Number HSCG83-09-J-3CL358

Subject: Groundwater Monitoring Report (March 2012 Event) for U.S. Coast Guard Atwater Facility

Dear Ms. Keller:

Tetra Tech, Inc. (Tt) is pleased to submit this quarterly Groundwater Monitoring Letter Report for the referenced Task Order for the United States Coast Guard (USCG) Atwater Facility in Detroit, Michigan. The objective of this portion of the project includes quarterly monitoring of the groundwater associated with the Atwater Facility (Figure 1). The sampling is being performed according to Modification 002 of the Task Order.

Four quarterly groundwater sampling events were performed. The first event was performed in April 2011 as part of the Site Investigation, the second event was performed in September 2011, and the third event was performed in December 2011. The fourth event, described in this report, was performed in March 2012. Field activities and groundwater analytical results for the March 2012 event are summarized in this report. The work was performed in accordance to the Field Sampling Plan - Soil and Groundwater (Tetra Tech, 2011) and the Quality Assurance Project Plan Addendum (Tetra Tech, 2011).

FIELD OPERATIONS

Depth-to-water measurements were obtained at the four monitoring wells and the Detroit River on March 6, 2012 (see Figure 1). Water level depths in the wells ranged from 1.43 (MW01) to 4.26 (MW03) feet below top of casing (BTOC). The depth to the river water surface was 4.78 feet from the reference point at the ground surface. Groundwater elevation data is provided in Table 1.

The groundwater level elevations in the four wells were lower (0.18 foot to 0.81 foot) than during the December 2011 event. The groundwater flow direction was toward the river. The river water level elevation was 0.58 foot lower than during the December 2011 event.

On March 6, 2012, Tt collected groundwater samples from the four monitoring wells. A duplicate sample was collected from well MW02. Samples were collected using low flow methods. Copies of the Groundwater Sample Log Sheets and Low Flow Purge Data Sheets are included in Attachment A. Following collection, the groundwater samples were shipped to Trimatrix Laboratories in Grand Rapids, Michigan for analysis of polynuclear aromatic hydrocarbons (PAHs) by EPA Method SW846 8310, and for total and dissolved Michigan 10 metals by EPA Methods 6020A and 7470A. Groundwater for dissolved metals analyses were filtered in the field using a 0.45 micron filter. Purge water was drummed on-site

and was subsequently disposed of off-site by EarthSmart Environmental Solutions, LLC after confirming the results of the groundwater analyses (see Attachment B).

RESULTS

The analytical results for this event are summarized in Table 2. This table also includes the results from the previous sampling events. A copy of the laboratory reports are provided in Attachment C. The data validation report is included in Attachment D as a separate pdf.

The analytical results were similar to the previous sampling events. As in the previous rounds, the highest concentrations of PAHs were in the sample from MW02. The concentrations of naphthalene and 2-methylnaphthalene were slightly higher compared to the last event, although concentrations were still less than the Michigan Department of Environmental Quality (MDEQ) residential exposure criteria.

Total metals concentrations and dissolved metals concentrations were generally slightly lower compared to the last event, except at MW2.

At well MW02, the total arsenic concentration was 14 µg/L (and the concentration in the duplicate was 14 µg/L) and, the dissolved arsenic concentration was 12 µg/L (and the concentration in the duplicate was 12 µg/L) compared to the United States Environmental Protection Agency (USEPA) Maximum Contaminant Level (MCL) of 10 µg/L. In the previous two sampling events, the total arsenic concentration range was 9.5 to 12 µg/L, and the dissolved arsenic concentration range was 9.0 to 9.2 µg/L. In the June 2011 sampling event, the total and dissolved arsenic concentrations were 6.2 µg/L and 1 µg/L (estimated), respectively. The turbidity value for the March 2012 event (1.5 NTU) was slightly higher than the last event (1.2 NTU), and the higher suspended solids concentration may contribute to the higher concentrations of arsenic. Also note that the water was clear, but small specks of black material were observed in the sample.

Samples from MW02 consistently had elevated concentrations of arsenic and PAHs compared to the other wells. No geochemistry parameters were measured, but several field parameters were measured during well purging (see Table 3). The oxidation-reduction potential (ORP) of well MW02 is very low compared to the other wells, suggesting reducing conditions caused by anaerobic biodegradation. Because of reducing conditions, arsenic in the soil may be released into solution. The elevated concentrations of organic compounds, for example naphthalene, suggest that a source of carbon is present that would support biological activity. The pH of samples from MW02 is approximately 1 unit higher than the pH in the other wells, which suggests a different geochemistry at this location. On one hand, anaerobic biological activity tends to reduce the pH. On the other hand, the land at the site consists of fill, and at this location, a high pH material (for example, limestone, lime, concrete, etc.) could be part of the fill. Thus, the low pH conditions promoted by the anaerobic biological activity may be buffered by the material in the fill.

CONCLUSIONS AND RECOMMENDATIONS

For the most part, concentrations of metals and PAHs were less than MDEQ criteria during all sampling events. No concentrations greater than criteria were observed in MW01 and MW03. However, organic compounds and reducing conditions in the groundwater appear to cause elevated concentrations of arsenic in the groundwater in MW02. In two of the four sampling events, the total arsenic concentration was less than the MCL, and in two other sampling events, the total arsenic concentration was greater than the MCL. In addition, the benzo(a)pyrene concentration was greater than the criterion during one event at MW02 and MW04. Long-term monitoring and/or remedial action may be necessary, after input and discussions with the regulatory agencies.

Should you have any questions, please contact the Project Manager, Mr. Joseph Logan at (412) 921-7231 or me at (412) 921-8415.

Very truly yours,

Roger A. Clark, Ph.D.
Program Manager

RAC

cc: file 112G02435
Joseph Logan

FIGURE

PGH P:\GIS\COASTGUARD\DETROIT_USCG\MAPDOCS\MXD\ATWATER_SURVEYED_MWS.MXD 08/16/11 JEE

DRAWN BY	DATE		MONITORING WELLS USCG ATWATER DETROIT, MICHIGAN	CONTRACT NUMBER	CTO NUMBER
J. ENGLISH	07/29/11			02435	—
CHECKED BY	DATE			APPROVED BY	DATE
S. HILL	08/16/11			—	—
REVISED BY	DATE			APPROVED BY	DATE
				—	—
SCALE AS NOTED				FIGURE NO. 1 2 - 2	REV 0

TABLES

TABLE 1

WATER LEVEL MEASUREMENTS
QUARTERLY MONITORING REPORT FOR MARCH 2012 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN

Well ID	Ground Surface Elevation (feet, NAVD 88)	Top of Casing (feet, NAVD 88)	Screened Interval		3/6/2012		12/16/2011		9/14/2011		6/6/2011	
			Top (feet bgs)	Bottom (feet bgs)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)	Depth to Water (feet BTOC)	Water Level (feet, NAVD 88)
MW01	579.58	579.53	3.0	13.0	1.43	578.10	1.00	578.53	1.70	577.83	2.22	577.31
MW02	579.54	579.62	3.0	13.0	3.42	576.20	3.20	576.42	3.32	576.30	3.95	575.67
MW03	579.33	579.00	3.0	13.0	4.26	574.74	4.08	574.92	3.94	575.06	3.89	575.11
MW04	578.68	578.11	3.0	13.0	3.30	574.81	2.49	575.62	3.05	575.06	3.18	574.93
River Level	578.69	NA	NA	NA	4.78	573.91	4.20	574.49	4.50	574.19	3.85	574.84

Notes:
bgs - below ground surface
BTOC - below top of casing
NAVD - North American Vertical Datum
NA - Not Applicable

TABLE 2

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR MARCH 2012 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 2

LOCATION	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	DAMW01				DAMW02						DAM		
SAMPLE DATE					6/6/2011	9/14/2011	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	12/16/2011-D	3/6/2012	3/6/2012-D	6/6/2011	6/6/2011-D	9/14/2011
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)																	
ARSENIC	10	10	10	10	0.95 J	0.73 J	0.36 J	0.6 J	1 J	9	9.3	9.2	12	12	2.7 J	2.7 J	4.3 J
BARIUM	2000	2000	670	2000	190 J	300	260	250	200 J	150	110	100	87	89	310 J	300 J	370
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.14 J	0.2 U	0.2 U	0.2 U	0.058 J	0.046 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CHROMIUM	100	100	100	100	0.3 J	0.27 J	1 U	1 U	0.47 J	0.45 J	0.38 J	0.37 J	1 U	1 U	0.21 J	1 U	0.22 J
COPPER	1300	1000	13	1300	0.44 J	0.61 J	0.28 J	1 U	0.42 J	0.16 J	1 U	0.28 J	1 U	1 U	1 U	1 U	1 U
LEAD	15	2	14	15	0.17 J	0.18 J	1 U	1 UJ	0.2 J	1 U	1 U	1 U	1 UJ	1 UJ	1 U	1 U	1 U
SELENIUM	50	50	5	50	5 UJ	1.1 J	5 U	5 U	5 UJ	5 UJ	5 U	5 U	0.39 J	1.3 J	5 UJ	5 UJ	0.97 J
ZINC	NC	2400	170	2400	5.5	6.7	6.5 U	10 U	5 U	5 U	6.9 U	7.8 U	10 U	10 U	4.2 J	3.9 J	5.5
TOTAL METALS (UG/L)																	
ARSENIC	10	10	10	10	1.5 J	1 J	0.52 J	0.83 J	6.2	12	9.5	10	14	14	2.6 J	2.5 J	4.8 J
BARIUM	2000	2000	670	2000	210	300	260	240	150	160	110	110	86	84	290	290	370
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.79 J	0.06 J	0.2 U	0.2 U	0.73 J	0.054 J	0.1 J	0.11 J	0.2 U	0.2 U	0.37 U
CHROMIUM	100	100	100	100	0.31 J	0.25 J	0.57 J	1 U	0.33 J	0.51 J	0.39 J	0.38 J	1 U	1.3 U	0.29 J	0.27 J	0.24 J
COPPER	1300	1000	13	1300	0.74 J	0.79 J	0.98 J	1 U	1.2	0.29 J	0.19 J	0.39 J	1 U	1 U	0.77 J	1 U	0.3 J
LEAD	15	2	14	15	0.73 J	1	0.63 J	0.26 J	0.85 J	0.39 J	0.16 J	0.23 J	1 U	1 U	0.47 J	0.33 J	0.7 J
SELENIUM	50	50	5	50	5 UJ	5 UJ	5 U	5 U	1 J	1.5 J	5 U	5 U	5 U	0.55 J	5 UJ	5 UJ	5 UJ
ZINC	NC	2400	170	2400	6.9 J	9.4	10	4 J	3.9 J	6.4	8.6	10	7.6 J	3.2 J	8.5 J	4.6 J	10
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)																	
2-METHYLNAPHTHALENE	NC	260	19	260	0.5 U	0.5 U	0.5 U	0.5 U	24 J	43	42	33	50	49	0.07 J	0.5 U	0.5 U
ACENAPHTHENE	NC	1300	38	1300	0.5 U	0.031 J	0.5 U	0.03 J	6 J	14	10	7.7 J	6.9	6.6	1.6	1.6	2.6
ACENAPHTHYLENE	NC	52	ID	52	0.5 U	0.5 U	0.5 U	0.5 U	1.7 J	3.8 J	3.7 J	2.6 J	3.9 J	3.7 J	0.05 J	0.5 U	0.5 U
ANTHRACENE	NC	43	ID	43	0.5 U	0.5 U	0.5 U	0.5 U	3.8 J	4.8 J	3.1 J	2.2 J	6.3	4.6 J	0.22 J	0.19 J	0.23 J
BENZO(A)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.051 J	0.06 J	0.28 J	1.3 J	1.2 J	10 U	0.92 J	0.72 J	0.5 U	0.5 U	0.072 J
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	1 J	10 U	10 U	5 U	5 U	0.5 U	0.5 U	0.052 J
BENZO(B)FLUORANTHENE	NC	1.5	ID	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U	5 U	5 U	0.5 U	0.5 U	0.5 U
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.1 J	0.5 U	0.05 J	12 U	10 U	10 U	0.41 J	5 U	0.5 U	0.5 U	0.5 U
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.041 J	0.5 U	0.1 J	12 U	10 U	10 U	5 U	5 U	0.5 U	0.5 U	0.5 U
DIBENZO(A,H)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U	5 U	5 U	0.5 U	0.5 U	0.5 U
FLUORANTHENE	NC	210	1.6	210	0.5 U	0.5 U	0.5 U	0.5 U	0.52 J	1.5 J	1 J	0.81 J	0.92 J	0.82 J	0.2 J	0.15 J	0.27 J
FLUORENE	NC	880	12	880	0.5 U	0.5 U	0.5 U	0.5 U	3.5 J	13	24	19	21	21	0.36 J	0.27 J	0.19 J
INDENO(1,2,3-CD)PYRENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	12 U	10 U	10 U	5 U	5 U	0.5 U	0.5 U	0.5 U
NAPHTHALENE	NC	520	11	520	0.5 U	0.5 U	0.5 U	0.04 J	120	170	170	130	180	180	0.19 J	0.11 J	0.062 J
PHENANTHRENE	NC	52	2	52	0.5 U	0.5 U	0.5 U	0.5 U	8.8 J	11 J	11	8.3 J	12	12	1.2	1	1.4
PYRENE	NC	140	ID	140	0.5 U	0.5 U	0.5 U	0.5 U	0.39 J	1.5 J	1 J	10 U	0.92 J	0.82 J	0.15 J	0.13 J	0.23 J

1 - For comparison only.
J - Estimated Concentration.
U - Below detection limit at detection limit shown.
D - Duplicate sample
Shaded cell indicates concentration greater than selected criterion.
bgs - Below ground surface.
GSI - Groundwater-surface water interface
ID - Insufficient data to develop criterion.
MCL - Maximum Contaminant Level.
NC - No criterion.
RBSL - Risk-Based Screening Level

TABLE 2

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR MARCH 2012 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 2 OF 2

LOCATION					W03			DAMW04			
SAMPLE DATE	FEDERAL MCL	Michigan Residential RBSL	Michigan GSI RBSL (1)	Selected Criteria	9/14/2011-D	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	3/6/2012
TOP OF SCREEN, FEET bgs					3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs					13	13	13	13	13	13	13
DISSOLVED METALS (UG/L)											
ARSENIC	10	10	10	10	4.1 J	1.3 J	0.71 J	3 J	3.6 J	1.2 J	0.84 J
BARIUM	2000	2000	670	2000	360	310	270	150 J	210	130	130
CADMIUM	5	5	2.5	5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.19 J
CHROMIUM	100	100	100	100	0.23 J	1 U	1 U	1 U	1 U	0.23 J	1 U
COPPER	1300	1000	13	1300	0.15 J	0.25 J	1 U	0.88 J	0.6 J	0.32 J	1 U
LEAD	15	2	14	15	1 U	1 U	1 UJ	0.44 J	0.45 J	0.17 J	2.8 J
SELENIUM	50	50	5	50	0.96 J	5 U	5 U	5 UJ	5 UJ	5 U	0.73 J
ZINC	NC	2400	170	2400	5 U	7.7 U	10 U	110	100	100	140
TOTAL METALS (UG/L)											
ARSENIC	10	10	10	10	4.4 J	1.3 J	0.75 J	3 J	3.8 J	1.1 J	0.87 J
BARIUM	2000	2000	670	2000	340	300	270	150	210	130	130
CADMIUM	5	5	2.5	5	1.1 J	0.051 J	0.2 U	0.2 U	0.2 U	0.091 J	0.25
CHROMIUM	100	100	100	100	0.24 J	0.22 J	1 U	0.36 J	1 U	1 U	1 U
COPPER	1300	1000	13	1300	0.37 J	0.39 J	1 U	2.6	1.8	0.64 J	1 U
LEAD	15	2	14	15	0.57 J	1.2	0.18 J	2.1	3.3	1.8	2.8
SELENIUM	50	50	5	50	5 UJ	5 U	5 U	5 UJ	5 UJ	5 U	0.79 J
ZINC	NC	2400	170	2400	8.4	8.4	2 J	110 J	120	110	150
POLYNUCLEAR AROMATIC HYDROCARBONS (UG/L)											
2-METHYLNAPHTHALENE	NC	260	19	260	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACENAPHTHENE	NC	1300	38	1300	2.9	1.5	1.6	0.05 J	0.03 J	0.5 U	0.5 U
ACENAPHTHYLENE	NC	52	ID	52	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ANTHRACENE	NC	43	ID	43	0.23 J	0.092 J	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U
BENZO(A)ANTHRACENE	NC	2	ID	2	0.051 J	0.041 J	0.051 J	0.5 U	0.5 U	0.19 J	0.5 U
BENZO(A)PYRENE	0.2	5	ID	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.24 J	0.5 U
BENZO(B)FLUORANTHENE	NC	1.5	ID	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J	0.5 U
BENZO(K)FLUORANTHENE	NC	1	NC	1	0.5 U	0.5 U	0.082 J	0.5 U	0.5 U	0.27 J	0.5 U
CHRYSENE	NC	1.6	ID	1.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.22 J	0.5 U
DIBENZO(A,H)ANTHRACENE	NC	2	ID	2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.14 J	0.5 U
FLUORANTHENE	NC	210	1.6	210	0.23 J	0.11 J	0.11 J	0.5 U	0.5 U	0.04 J	0.5 U
FLUORENE	NC	880	12	880	0.28 J	0.13 J	0.13 J	0.5 U	0.5 U	0.5 U	0.5 U
INDENO(1,2,3-CD)PYRENE	NC	2	ID	2	0.5 U	0.5 U	0.14 J	0.5 U	0.5 U	0.14 J	0.5 U
NAPHTHALENE	NC	520	11	520	0.5 U	0.5 U	0.5 U	0.05 J	0.5 U	0.5 U	0.5 U
PHENANTHRENE	NC	52	2	52	1.5	0.6	0.67	0.05 J	0.5 U	0.5 U	0.5 U
PYRENE	NC	140	ID	140	0.24 J	0.1 J	0.082 J	0.04 J	0.5 U	0.061 J	0.5 U

1 - For comparison only.
J - Estimated Concentration.
U - Below detection limit at detection limit shown.
D - Duplicate sample
Shaded cell indicates concentration greater than selected criterion.
bgs - Below ground surface.
GSI - Groundwater-surface water interface
ID - Insufficient data to develop criterion.
MCL - Maximum Contaminant Level.
NC - No criterion.
RBSL - Risk-Based Screening Level

TABLE 3

SUMMARY OF FIELD WATER QUALITY PARAMETERS IN GROUNDWATER
QUARTERLY MONITORING REPORT FOR MARCH 2012 EVENT
USCG ATWATER FACILITY
DETROIT, MICHIGAN
PAGE 1 OF 1

LOCATION	DAMW01				DAMW02				DAMW03				DAMW04			
SAMPLE DATE	6/6/2011	9/14/2011	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	3/6/2012	6/6/2011	9/14/2011	12/16/2011	3/6/2012
TOP OF SCREEN, FEET bgs	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
BOTTOM OF SCREEN, FEET bgs	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Color	clear	clear	clear	clear	clear	clear	clear	clear w/black specks	clear	clear	clear	clear	clear	clear	clear	clear
pH (SU)	6.8	6.5	6.8	7.0	7.7	7.3	7.6	8.1	7.2	6.7	6.5	7.2	7.3	6.7	6.7	7.1
SC (mS/cm)	0.992	1.04	1.08	1.02	1.49	1.38	1.48	1.27	0.925	0.99	1.06	0.992	0.694	0.863	0.71	0.664
Temp (°C)	18.4	20.3	9.5	7.0	12.5	19.0	10.4	8.8	12.5	21.8	10.6	8.8	16.1	22.8	11.0	8.4
Turbidity (NTU)	0.0	0.0	8.8	5.1	0.0	1.7	1.2	1.5	0.7	1.3	4.5	0.5	1.7	0.0	3.6	0
DO (mg/l)	0.0	0.26	0.0	2.08	0.0	0.37	0.0	1.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salinity (ppt)	0.3	0.5	0.3	0.3	0.4	0.7	0.4	0.3	0.2	NM	0.0	0.3	0.2	NM	0.0	0.2
ORP (mV)	-176	-158	-204	-98	-192	-297	-294	-255	-107	-92	-74	-123	-53	-21	-24	-15

bgs - below ground surface.
mg/L - milligrams per liter
mS/cm - millisiemens per centimeter.
mV - millivolts.
NTU - nephelometric turbidity units.
ppt - parts per thousand.
SU - standard units.

ATTACHMENT A
FIELD FORMS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DA-MW01-0312
Sample Location: DA-MW01
Sampled By: SEH
C.O.C. No.: 0092
Type of Sample:
[X] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 3/6/12 Time: 1340 Method: LF/Grab	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
	Clear	7.01	1.02	7.02	5.08	2.08	0.3	-98

PURGE DATA:

Date: 3/6/12	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: LF/Grab								
Monitor Reading (ppm): NA		See Low Flow Logsheet						
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13'								
Static Water Level (WL): 1.45								
One Casing Volume (gal/L): ~1.8								
Start Purge (hrs): 1250								
End Purge (hrs): 1340								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 2.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	4C	2- 1 L amber	yes
Total Metals	HNO3	250 ML plastic	yes
Dissolved Metals (field filtered)	HNO3	250 - ML plastic	yes

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Detroit Atwater
PROJECT NUMBER: 112G02435
WELL ID.: DA-MW101
DATE: 3/6/12

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1250	1.45	Turbo - start purge								
1255	1.55	160	7.57	1.06	7.6	1.47	7.47	-90	0.3	
1305	1.57	160	7.[illegible]	1.03	7.69	0.76	7.24	-93	0.3	
1315	1.63	160	7.02	1.02	5.33	1.28	6.99	-95	0.3	
1325	1.59	125	7.01	1.02	5.31	1.15	6.95	-96	0.3	
1335	1.58	125	7.01	1.02	5.08	2.08	7.02	-98	0.3	
1340	collect sample									

SIGNATURE(S): [signature]

PAGE 2 OF 2

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DA-MW02-0312
Sample Location: DA-MW02
Sampled By: SEH
C.O.C. No.: 0089
Type of Sample:
[X] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 3/7/12 Time: 1510	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Method: LF/Grab	CLR W/ BLACK SPECKS	8.10	1.27	8.79	1.49	1.65	0.3	-255

PURGE DATA:

Date: 3/7/12	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: LF/Grab								
Monitor Reading (ppm): NA		See Low Flow Logsheet						
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): ~13'								
Static Water Level (WL): 3.42								
One Casing Volume(gal/L): ~1.5								
Start Purge (hrs): 1410								
End Purge (hrs): 1610								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 2.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	4C	2-1 L amber	yes
Total Metals	HNO3	250 ML plastic	yes
Dissolved Metals (field filtered)	HNO3	250 - ML plastic	yes

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD

Duplicate ID No.: DA-030612_DUP01

Signature(s):

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Detroit Atwater
PROJECT NUMBER: 112G02435
WELL ID.: DAMW02-0312
DATE: 3/6/12

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1410	3.42									small black flakes
1415	3.75	150	8.02	1.05	2.41	3.59	8.05	-173	0.3	Burned Odor
1425	4.0	150	8.42	1.06	3.50	3.18	8.15	-206	0.3	
1435	4.1	150	8.49	1.10	2.49	2.32	8.22	-219	0.3	
1447	4.2	150	8.36	1.17	1.87	1.30	8.39	-237	0.3	
1455	4.2	150	8.21	1.23	1.48	1.37	8.61	-248	0.3	
1505	4.2	150	8.10	1.27	1.49	1.55	8.79	-255	0.3	
1510	collect sample									
	+ DUP @	DA-030612-DUP01								

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DA-MW03-0312
Sample Location: DA-MW03
Sampled By: T. ROSATI
C.O.C. No.: 0089

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3/7/12 Time: 1340	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity ppt ~~%~~	Other ORP (mV)
Method: LF/Grab	CLEAR	7.19	0.592	11.83	0.5	0.00	0.3	-123

PURGE DATA:

Date: 3/7/12	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: LF/Grab								
Monitor Reading (ppm): NA		See Low Flow Logsheet						
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.20								
Static Water Level (WL): 4.33								
One Casing Volume(gal/L): 5.6								
Start Purge (hrs): 1255								
End Purge (hrs): 1335								
Total Purge Time (min): 40								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	4C	2- 1 L amber	yes
Total Metals	HNO3	250 ML plastic	yes
Dissolved Metals (field filtered)	HNO3	250 - ML plastic	yes

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD: YES

Duplicate ID No.:

Signature(s):

Tony Rosati

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: ___USCG Detroit Atwater_____ WELL ID.: DA-MW03

PROJECT NUMBER: ___112G02435_____ DATE: 3/7/12

6 TR

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or (ppt)	Comments
1255	4.33	0	-	-	-	-	-	-	-	START PURGE
1305	4.38	200	7.20	0.991	3.30	0.38	8.99	-131	0.3	2000 CLEAR
1315	4.40	200	7.23	0.992	1.5	0.05	8.76	-126	0.3	4000 "
1325	4.41	200	7.20	0.992	0.9	0.05	8.92	-123	0.3	6000 "
1335	4.41	200	7.19	0.992	0.5	0.00	8.83	-123	0.3	8000 "
1340	-	-	-	-	-	-	-	-	-	SAMPLE TIME

SIGNATURE(S): Tony Kopek

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Detroit Atwater
Project No.: 112G02435

Sample ID No.: DA-MW04-0312
Sample Location: DA-MW04
Sampled By: T. ROJAHN
C.O.C. No.: 0089

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3/7/12	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1525	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	~~ppt~~	ORP mV
Method: LF/Grab	CLEAR	7.14	0.664	8.41	0.0	0.00	0.2	-15

PURGE DATA:

Date: 3/7/12	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: LF/Grab								
Monitor Reading (ppm): NA		See Low Flow Logsheet						
Well Casing Diameter & Material								
Type: 2" PVC								
Total Well Depth (TD): 13.10								
Static Water Level (WL): 3.28								
One Casing Volume(gal/L): 6.2								
Start Purge (hrs): 1430								
End Purge (hrs): 1520								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 10								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PAHs	4C	2- 1 L amber	yes
Total Metals	HNO3	250 ML plastic	yes
Dissolved Metals (field filtered)	HNO3	250 - ML plastic	yes

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Rojahn

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: USCG Detroit Atwater
PROJECT NUMBER: 112G02435
WELL ID.: DA-MW04
DATE: 3/~~7~~6/12

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	S. Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celcius)	ORP mV	Salinity % or ppt	Comments
1430	3.28	0	–	–	–	–	–	–	–	START PURGE
1440	3.51	200	7.31	0.657	4.2	0.17	8.65	-2	0.2	2000 CLEAR
1450	3.57	200	7.33	0.661	2.9	0.05	8.45	-5	0.2	4000 CLEAR
1500	3.58	200	7.24	0.662	0.9	0.05	8.29	-5	0.2	6000 CLEAR
1510	3.60	200	7.16	0665	0.1	0.05	8 34	-12	0.2	8000 CLEAR
1515	3.61	200	7.18	0664	0.0	0.00	8.36	-16	0.2	9000 CLEAR
1520	3.61	200	7.14	0.664	0.0	0.00	8.41	-15	0.2	10000 CLEAR
1525	—	—	—	—	—	—	—	—	—	SAMPLE TIME

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: USCG Detroit Atwat
Project No.: 112G02435
Location: Detroit
Personnel: S. Hill; T. Rojahn
Weather Conditions: Cool, windy, snowy
Measuring Device: ~~Solinst~~ Heron
Tidally Influenced: Yes ___ No X
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
DA-MW01	3/7/2012	1205			1.43			
DA-MW02	3/7/2012	1207			3.42			
DA-MW03	3/7/2012	1210			4.26			
DA-MW04	3/7/2012	1212			3.30			
river	3/7/2012	1213			4.78			

* All measurements to the nearest 0.01 foot

ATTACHMENT B
DISPOSAL MANIFEST

008258318JJK

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MI2 690 308 471	1	(313) 347-1300	008258318 JJK

5. Generator's Name and Mailing Address: USCG SECTOR DETROIT
C/O EARTH SMART ENV.
525 E. MICHIGAN AVE. #124
SALINE, MI 48176
Generator's Phone: (313) 568-9551

Generator's Site Address (if different than mailing address):
UNITED STATES COAST GUARD
2660 EAST ATWATER STREET
DETROIT, MI 48207

6. Transporter 1 Company Name: EQ INDUSTRIAL SERVICES — U.S. EPA ID Number: MI0 000 263 871

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: EQ DETROIT, INC.
1923 FREDERICK
DETROIT, MI 48211
Facility's Phone: (313) 347-1300
U.S. EPA ID Number: MID 980 991 566

9a. HM	9b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. Non Hazardous Liquid Waste, Not Dot Not RCRA Regulated	001	DM	55	G	0291
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. F107164DET / Non Haz IDW Liquids (1x55)

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Patrick Engler — Signature: [signature] — Month 4 Day 5 Year 12

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Scott Belasco — Signature: [signature] — Month 4 Day 5 Year 12
Transporter 2 Printed/Typed Name: — Signature: — Month Day Year

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. LIW 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: [signature] — Signature: [signature] — Month 4 Day 5 Year 12

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

CERTIFICATE OF MANAGEMENT

This Certificate is to verify that the wastes specified on the following manifest(s) have been properly received and will be properly managed to meet all applicable local, state, and federal regulations.

Generator Name:	United States Coast Guard	
Manifest/BOL Number:	008258318JJK	
Approval Number(s):	F107164DET	

FACILITY NAME: EQ DETROIT, INC.
EPA ID#:MID980991566

ADDRESS: 1923 Frederick

PHONE NUMBER: 313-347-1300
FAX NUMBER: 313.923.3375

AUTHORIZED SIGNATURE: Bill Lofell on behalf of EQ Detroit

ATTACHMENT C
LABORATORY REPORTS

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW01-0312**	Sampled:	03/06/12 13:40
Lab Sample ID:	**1203114-01**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30
Unit:	ug/L	Prepared:	03/09/12 By: JTS
Dilution Factor:	1	Analyzed:	03/12/12 By: DMC
QC Batch:	1203132	Analytical Batch:	2C13014

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**0.030J**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.060J**	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
*205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
*207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	**0.040J**	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	0.50U	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	*45*	*40-110*
2-Fluorobiphenyl	*76*	*50-110*
o-Terphenyl	*88*	*50-135*

*See Statement of Data Qualifications

This report shall not be reproduced, except in full, without written authorization of TriMatrix Laboratories, Inc.
Individual sample results relate only to the sample tested.
5560 Corporate Exchange Court SE ♦ Grand Rapids, MI 49512 ♦ 616.975.4500 ♦ Fax 616.942.7463 ♦ www.trimatrixlabs.com

TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW01-0312**	Sampled:	03/06/12 13:40
Lab Sample ID:	**1203114-01**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.60**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116
Barium	**250**		10	0.68	ug/L	5	USEPA-6020A	03/13/12 12:30	DSC	1203116
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116
Chromium	**0.26**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	03/14/12 08:05	DSC	1203116
Copper	**0.52**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 12:16	CKD	1203161
Selenium	5.0	U	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116
Zinc	**4.7**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 10:29	DSC	1203116

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW01-0312**	Sampled:	03/06/12 13:40
Lab Sample ID:	**1203114-01**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.63**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Barium	**240**		10	0.68	ug/L	5	USEPA-6020A	03/13/12 11:09	DSC	1203111
Cadmium	**0.060**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Chromium	**0.32**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Copper	**0.76**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Lead	**0.26**	**J**	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 11:18	CKD	1203160
Selenium	5.0	U	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111
Zinc	**4.0**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 09:42	DSC	1203111

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW03-0312**	Sampled:	03/06/12 13:40
Lab Sample ID:	**1203114-02**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30
Unit:	ug/L	Prepared:	03/09/12 By: JTS
Dilution Factor:	1	Analyzed:	03/12/12 By: DMC
QC Batch:	1203132	Analytical Batch:	2C13014

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**1.6**	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	**0.13J**	0.50	0.038
56-55-3	Benzo(a)anthracene	**0.051J**	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	**0.082J**	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	**0.11J**	0.50	0.033
86-73-7	Fluorene	**0.13J**	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	**0.14J**	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	**0.67**	0.50	0.035
129-00-0	Pyrene	**0.082J**	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	*46*	*40-110*
2-Fluorobiphenyl	*69*	*50-110*
o-Terphenyl	*90*	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW03-0312**	Sampled:	03/06/12 13:40
Lab Sample ID:	**1203114-02**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.71**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116
***Barium**	**270**		10	0.68	ug/L	5	USEPA-6020A	03/13/12 12:33	DSC	1203116
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	03/14/12 08:07	DSC	1203116
Copper	**0.21**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116
*Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 12:21	CKD	1203161
Selenium	5.0	U	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116
Zinc	**1.8**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 10:33	DSC	1203116

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW03-0312**	Sampled:	03/06/12 13:40
Lab Sample ID:	**1203114-02**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.75**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Barium	**270**		10	0.68	ug/L	5	USEPA-6020A	03/13/12 11:13	DSC	1203111
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Copper	**0.22**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Lead	**0.18**	**J**	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 11:23	CKD	1203160
Selenium	5.0	U	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111
Zinc	**2.0**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 09:46	DSC	1203111

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW02-0312**	Sampled:	03/06/12 15:10
Lab Sample ID:	**1203114-03**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30
Unit:	ug/L	Prepared:	03/09/12 By: JTS
Dilution Factor:	10	Analyzed:	03/12/12 By: DMC
QC Batch:	1203132	Analytical Batch:	2C13014

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**6.9**	5.0	0.29
208-96-8	Acenaphthylene	**3.9J**	5.0	0.36
120-12-7	Anthracene	**6.3**	5.0	0.38
56-55-3	Benzo(a)anthracene	**0.92J**	5.0	0.32
50-32-8	Benzo(a)pyrene	5.0U	5.0	0.29
205-99-2	Benzo(b)fluoranthene	5.0U	5.0	0.68
*207-08-9	Benzo(k)fluoranthene	**0.41J**	5.0	0.40
191-24-2	Benzo(g,h,i)perylene	5.0U	5.0	2.7
218-01-9	Chrysene	5.0U	5.0	0.36
53-70-3	Dibenz(a,h)anthracene	5.0U	5.0	1.2
206-44-0	Fluoranthene	**0.92J**	5.0	0.33
86-73-7	Fluorene	**21**	5.0	0.44
193-39-5	Indeno(1,2,3-cd)pyrene	5.0U	5.0	1.1
91-57-6	2-Methylnaphthalene	**50**	5.0	0.36
91-20-3	Naphthalene	**180**	5.0	0.31
85-01-8	Phenanthrene	**12**	5.0	0.35
129-00-0	Pyrene	**0.92J**	5.0	0.38

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	*60*	*40-110*
2-Fluorobiphenyl	*74*	*50-110*
o-Terphenyl	*85*	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW02-0312**	Sampled:	03/06/12 15:10
Lab Sample ID:	**1203114-03**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**12**		5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Barium	**87**		2.0	0.14	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Chromium	**0.24**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	03/14/12 08:20	DSC	1203116
Copper	**0.44**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 12:35	CKD	1203161
Selenium	**0.39**	**J**	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116
Zinc	**2.0**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 10:51	DSC	1203116

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW02-0312**	Sampled:	03/06/12 15:10
Lab Sample ID:	**1203114-03**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**14**		5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Barium	**86**		2.0	0.14	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Cadmium	**0.10**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Chromium	**0.66**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Copper	**0.57**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 11:38	CKD	1203160
Selenium	5.0	U	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111
Zinc	**7.6**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 10:04	DSC	1203111

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW04-0312**	Sampled:	03/06/12 15:25
Lab Sample ID:	**1203114-04**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30
Unit:	ug/L	Prepared:	03/09/12 By: JTS
Dilution Factor:	1	Analyzed:	03/12/12 By: DMC
QC Batch:	1203132	Analytical Batch:	2C13014

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	0.50U	0.50	0.029
208-96-8	Acenaphthylene	0.50U	0.50	0.036
120-12-7	Anthracene	0.50U	0.50	0.038
56-55-3	Benzo(a)anthracene	0.50U	0.50	0.032
50-32-8	Benzo(a)pyrene	0.50U	0.50	0.029
205-99-2	Benzo(b)fluoranthene	0.50U	0.50	0.068
207-08-9	Benzo(k)fluoranthene	0.50U	0.50	0.040
191-24-2	Benzo(g,h,i)perylene	0.50U	0.50	0.27
218-01-9	Chrysene	0.50U	0.50	0.036
53-70-3	Dibenz(a,h)anthracene	0.50U	0.50	0.12
206-44-0	Fluoranthene	0.50U	0.50	0.033
86-73-7	Fluorene	0.50U	0.50	0.044
193-39-5	Indeno(1,2,3-cd)pyrene	0.50U	0.50	0.11
91-57-6	2-Methylnaphthalene	0.50U	0.50	0.036
91-20-3	Naphthalene	0.50U	0.50	0.031
85-01-8	Phenanthrene	0.50U	0.50	0.035
129-00-0	Pyrene	0.50U	0.50	0.038

Surrogates:	*% Recovery*	*Control Limits*
Nitrobenzene-d5	*42*	*40-110*
2-Fluorobiphenyl	*71*	*50-110*
o-Terphenyl	*80*	*50-135*

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW04-0312**	Sampled:	03/06/12 15:25
Lab Sample ID:	**1203114-04**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.84**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 11:02	DSC	1203116
Barium	**130**		10	0.68	ug/L	5	USEPA-6020A	03/13/12 12:47	DSC	1203116
Cadmium	**0.19**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 11:02	DSC	1203116
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	03/14/12 08:27	DSC	1203116
Copper	**1.0**		1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 11:02	DSC	1203116
Lead	**2.8**		1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 11:02	DSC	1203116
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 12:40	CKD	1203161
Selenium	**0.73**	**J**	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 11:02	DSC	1203116
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 11:02	DSC	1203116
Zinc	**140**		50	7.5	ug/L	5	USEPA-6020A	03/13/12 12:47	DSC	1203116

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-MW04-0312**	Sampled:	03/06/12 15:25
Lab Sample ID:	**1203114-04**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**0.87**	**J**	5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Barium	**130**		10	0.68	ug/L	5	USEPA-6020A	03/13/12 11:31	DSC	1203111
Cadmium	**0.25**		0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Chromium	1.0	U	1.0	0.20	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Copper	**0.90**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Lead	**2.8**		1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 11:43	CKD	1203160
Selenium	**0.79**	**J**	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 10:08	DSC	1203111
Zinc	**150**		50	7.5	ug/L	5	USEPA-6020A	03/13/12 11:31	DSC	1203111

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-030612-DUP01**	Sampled:	03/06/12 00:00
Lab Sample ID:	**1203114-05**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30
Unit:	ug/L	Prepared:	03/09/12 By: JTS
Dilution Factor:	10	Analyzed:	03/12/12 By: DMC
QC Batch:	1203132	Analytical Batch:	2C13014

Semivolatile Organic Compounds by EPA Method 8270C

CAS Number	Analyte	Analytical Result	RL	MDL
83-32-9	Acenaphthene	**6.6**	5.0	0.29
208-96-8	Acenaphthylene	**3.7J**	5.0	0.36
120-12-7	Anthracene	**4.6J**	5.0	0.38
56-55-3	Benzo(a)anthracene	**0.72J**	5.0	0.32
50-32-8	Benzo(a)pyrene	5.0U	5.0	0.29
205-99-2	Benzo(b)fluoranthene	5.0U	5.0	0.68
207-08-9	Benzo(k)fluoranthene	5.0U	5.0	0.40
191-24-2	Benzo(g,h,i)perylene	5.0U	5.0	2.7
218-01-9	Chrysene	5.0U	5.0	0.36
53-70-3	Dibenz(a,h)anthracene	5.0U	5.0	1.2
206-44-0	Fluoranthene	**0.82J**	5.0	0.33
86-73-7	Fluorene	**21**	5.0	0.44
193-39-5	Indeno(1,2,3-cd)pyrene	5.0U	5.0	1.1
91-57-6	2-Methylnaphthalene	**49**	5.0	0.36
91-20-3	Naphthalene	**180**	5.0	0.31
85-01-8	Phenanthrene	**12**	5.0	0.35
*129-00-0	Pyrene	**0.82J**	5.0	0.38

Surrogates:	***% Recovery***	***Control Limits***
Nitrobenzene-d5	*59*	*40-110*
2-Fluorobiphenyl	*68*	*50-110*
o-Terphenyl	*79*	*50-135*

*See Statement of Data Qualifications

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-030612-DUP01**	Sampled:	03/06/12 00:00
Lab Sample ID:	**1203114-05**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Dissolved Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**12**		5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Barium	**89**		2.0	0.14	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Cadmium	0.20	U	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Chromium	**0.45**	**J**	1.0	0.20	ug/L	1	USEPA-6020A	03/14/12 08:29	DSC	1203116
Copper	**0.48**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 12:45	CKD	1203161
Selenium	**1.3**	**J**	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116
Zinc	**2.1**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 11:06	DSC	1203116

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TRIMATRIX LABORATORIES

ANALYTICAL REPORT

Client:	**TETRA TECH NUS - Pittsburgh**	Work Order:	**1203114**
Project:	USCG Atwater Facility	Description:	112G02435
Client Sample ID:	**DA-030612-DUP01**	Sampled:	03/06/12 00:00
Lab Sample ID:	**1203114-05**	Sampled By:	T.R.
Matrix:	Water	Received:	03/08/12 08:30

Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Time Analyzed	By	QC Batch
Arsenic	**14**		5.0	0.18	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Barium	**84**		2.0	0.14	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Cadmium	**0.11**	**J**	0.20	0.038	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Chromium	**1.3**		1.0	0.20	ug/L	1	USEPA-6020A	03/14/12 07:58	DSC	1203111
Copper	**0.49**	**J**	1.0	0.13	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Lead	1.0	U	1.0	0.15	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Mercury	0.20	U	0.20	0.055	ug/L	1	USEPA-7470A	03/13/12 11:48	CKD	1203160
Selenium	**0.55**	**J**	5.0	0.31	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Silver	0.50	U	0.50	0.037	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111
Zinc	**3.2**	**J**	10	1.5	ug/L	1	USEPA-6020A	03/13/12 10:18	DSC	1203111

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TRIMATRIX LABORATORIES

STATEMENT OF DATA QUALIFICATIONS

Semivolatile Organic Compounds by EPA Method 8270C

Qualification: Manual integration was performed on this sample for the analyte(s) listed below in accordance with the TriMatrix Manual Integration SOP. All necessary documentation, including the signed review, is included in the raw data section of the data package.

Analysis: USEPA-8270C

Sample/Analyte:		
1203114-01	DA-MW01-0312	Benzo(b)fluoranthene
1203114-01	DA-MW01-0312	Benzo(k)fluoranthene
1203114-03	DA-MW02-0312	Benzo(k)fluoranthene
1203114-03	DA-MW02-0312	Naphthalene-d8
1203114-03	DA-MW02-0312	Phenanthrene-d10
1203114-04	DA-MW04-0312	Phenanthrene-d10
1203114-05	DA-030612-DUP01	Acenaphthene-d10
1203114-05	DA-030612-DUP01	Naphthalene-d8
1203114-05	DA-030612-DUP01	Phenanthrene-d10
1203114-05	DA-030612-DUP01	Pyrene
1203132-BLK1		Nitrobenzene-d5
1203132-BS1		Naphthalene
1203132-MS1		Fluorene
1203132-MS1		Naphthalene
1203132-MSD1		Naphthalene
1203132-MSD1		Phenanthrene-d10

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STATEMENT OF DATA QUALIFICATIONS

Dissolved Metals by EPA 6000/7000 Series Methods

Qualification: The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte: 1203114-02 DA-MW03-0312 Lead

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.

Analysis: USEPA-6020A

Sample/Analyte: 1203114-02 DA-MW03-0312 Barium

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TRIMATRIX LABORATORIES

STATEMENT OF DATA QUALIFICATIONS

Total Metals by EPA 6000/7000 Series Methods

Qualification: The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte: 2C13001-CAL1 Arsenic

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ATTACHMENT D
DATA VALIDATION REPORT
(on pdf)

MARCH 2012 DATA VALIDATION REPORT

DATA VALIDATION REPORT IS PROVIDED ON CD