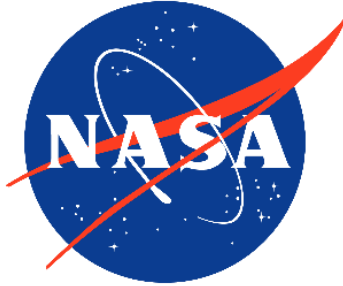


2023
LONG-TERM GROUNDWATER MONITORING REPORT
INDUSTRIAL AREA
KENNEDY SPACE CENTER, FLORIDA

Prepared for:



Environmental Assurance Branch
National Aeronautics and Space Administration
Kennedy Space Center, Florida 32899

A-E Contract 80KSC019D0010
Task Order 80KSC019F0071

July 2024
Revision 0

Prepared by:
AECOM Technical Services, Inc.
150 North Orange Avenue, Suite 200
Orlando, Florida 32801
407-843-6552

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In accordance with the provisions of Florida Statutes, Chapter 471, this Long-Term Groundwater Monitoring Report for the Kennedy Space Center Industrial Area located in Merritt Island, Florida, has been prepared under the direct supervision of a Professional Engineer registered in the State of Florida. This work was performed in accordance with generally accepted professional engineering practices under Chapter 471 of the Florida Statutes. The data, findings, recommendations, specifications, or professional opinions were prepared solely for the use of the National Aeronautics and Space Administration and the Florida Department of Environmental Protection. AECOM makes no other warranty, either expressed or implied, and is not responsible for the interpretation by others of these data.

This item has been digitally signed and sealed by:

Jennifer Gootee, P.E. Date
Program Manager
Florida License No. 57964
Engineering Business No. 8115
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ABBREVIATIONS, ACRONYMS, AND SYMBOLS

AECOM	AECOM Technical Services, Inc.
ARCADIS	Arcadis U.S., Inc.
AS	air sparge
AST	aboveground storage tank
BKG	background
bls	below land surface
CCF	Components Cleaning Facility
CCSFS	Cape Canaveral Space Force Station
Cis-1,2-DCE	cis-1,2-dichloroethene
COC	contaminant of concern
DPT	direct push technology
EDL	Engineering Development Laboratory
EHF	Environmental Health Facility
ERD	enhanced reductive dechlorination
Eurofins	Eurofins Environment Testing Southeast, LLC
FDEP	Florida Department of Environmental Protection
FSA1	Fuel Storage Area #1 Underground Storage Tank (Building 1044)
ft	foot/feet
GCTL	Groundwater Cleanup Target Level
GSSP	General Services Administration Seized Property
IA	Industrial Area
ID	Identification
IDW	investigation-derived waste
IM	interim measure
JP	jet propellant
KARS Park 1	Kennedy Athletic, Recreation, and Social Park 1
KEDD	Kennedy Space Center Electronic Data Deliverable
KSC	Kennedy Space Center
KSCRT	Kennedy Space Center Remediation Team
LETF	Launch Equipment Test Facility
LFR	Levine Fricke Recon, Inc.
LOC	Location of Concern
LTM	Long-Term Monitoring

M505	Building M7-0505 Treatment Tank Area
MNA	monitored natural attenuation
MOBIL	Mobil Service Station
MW	monitoring well
NADC	Natural Attenuation Default Concentration
NASA	National Aeronautics and Space Administration
NAVD88	North American Vertical Datum of 1988
NFA	No Further Action
NWS	National Weather Service
O&C	Operations and Checkout Building
PAH	polynuclear aromatic hydrocarbon
PCE	tetrachloroethene
PRL	potential release location
RCRA	Resource Conservation and Recovery Act
RFI	Resource Conservation and Recovery Act Facility Investigation
RIS	Remediation Information System
ROB	range of background
RP	rocket propellant
RRLF	Ransom Road Landfill
SAP	Sampling and Analysis Plan
SCTL	soil cleanup target level
SSPF	Space Station Processing Facility
SWMU	Solid Waste Management Unit
TCE	trichloroethene
TOC	top of casing
TPH	total petroleum hydrocarbons
UST	underground storage tank
VC	vinyl chloride
VOC	volatile organic compound
VPF	Vertical Processing Facility
WL	water level
µg/L	micrograms per liter

Long-Term Groundwater Monitoring Report
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EXECUTIVE SUMMARY

This report presents the 2023 groundwater sampling results from the National Aeronautics and Space Administration (NASA) Industrial Area (IA) Long-Term Monitoring (LTM) activities. Due to the project contract ending in 2023, this report presents one year of LTM activities instead of the two-year timeframe presented in previous reports. The NASA IA LTM Program includes the following 12 sites:

- Ransom Road Landfill (RRLF) – Solid Waste Management Unit (SWMU) 003
- Building M7-0505 Treatment Tank Area (M505) – SWMU 039
- Operations and Checkout Building (O&C) – SWMU 076
- Vertical Processing Facility (VPF) – SWMU 077
- Environmental Health Facility (EHF) – SWMU 079
- Kennedy Athletic, Recreation, and Social Park 1 (KARS Park 1) – SWMU 084
- Engineering Development Laboratory (EDL) – SWMU 085
- Launch Equipment Test Facility (LETf) – SWMU 091
- Mobil Service Station (MOBIL) – SWMU 093
- General Services Administration Seized Property (GSSP) – SWMU 095
- Space Station Processing Facility (SSPF) – SWMU 098
- Fuel Storage Area #1 Underground Storage Tank [Building 1044] (FSA1) – Potential Release Location (PRL) 157

Sampling events for the IA LTM Program are conducted seasonally during the dry and wet seasons, which occur in May and November, respectively. The sites in the NASA IA LTM Program are sampled on annual, biennial, or 5-year sampling frequencies based on historical trends.

The current sampling frequencies for the NASA IA LTM sites are as follows:

- FSA1 is sampled annually, alternating between wet and dry seasons.
- GSSP is sampled annually during the wet season.
- Seven sites are sampled biennially, alternating between the wet and dry seasons (RRLF, M505, O&C, VPF, LETf, MOBIL, and SSPF).
- EHF and EDL are sampled biennially during the wet season.
- KARS Park 1 is sampled once every 5 years.

The scheduled 2023 NASA IA LTM Program field activities included gauging groundwater levels and sampling monitoring wells at four sites (KARS Park 1, LETf, GSSP, and FSA1). Un-ionized ammonia concentrations were calculated at SSPF to evaluate the calculated concentrations against the alternative Groundwater Cleanup Target Level (GCTL) for un-ionized ammonia. Based on the results of the 2023 NASA IA LTM sampling activities and SSPF un-ionized ammonia calculations, the following recommendations are for the 2024-2025 NASA IA LTM Program:

KENNEDY ATHLETIC, RECREATION, AND SOCIAL PARK 1 - LOC 9

Groundwater LTM at KARS Park 1 Location of Concern (LOC) 9 is recommended to discontinue. Total lead concentrations were below the State of Florida GCTL at monitoring well KP1-MW0022, the one remaining monitoring well in the LTM program at KARS PARK 1 LOC 9, in May 2022 [2.5 U µg/L] and May 2023 [1.1 U µg/L].

LAUNCH EQUIPMENT TEST FACILITY

The biennial sampling frequency is recommended to continue at monitoring wells LETF-MW0001 and LETF-PSB-MW0001I with 14 groundwater level measurements. The addition of trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE) analysis is recommended to check for additional dechlorination byproduct concentrations at the site. The next sampling event at LETF is scheduled for November 2025.

GENERAL SERVICES ADMINISTRATION SEIZED PROPERTY

The list of monitoring wells in which monitored natural attenuation (MNA) parameters are sampled during the expanded sampling events is recommended to be adjusted to focus on the monitoring wells with current VC exceedances to evaluate reductive dechlorination conditions within the plume area. Monitoring wells GSSP-MW0019, GSSP-MW0020, and GSSP-MW0053 are recommended to include methane, ethane, and ethene; Dehalococoides; and total organic carbon analyses during the five-year expanded sampling events.

Based on a review of historical data following the February 2024 KSCRT meeting, monitoring wells GSSP-MW0050 (5-15 ft bls), GSSP-MW0051 (15-25 ft bls), and GSSP-MW0052 (25-35 ft bls) were found to be located upgradient of monitoring wells GSSP-MW0019 and GSSP-MW0020 and were last sampled in 2009, during the RFI. VC concentrations were reported equal to the GCTL at monitoring well GSSP-MW0050 and exceeding the NADC at monitoring wells GSSP-MW0051 and GSSP-MW0052; however, these three monitoring wells were not included in the original LTM plan. VC concentrations have reduced to below the GCTL around the source area; therefore, these monitoring wells are recommended to be added to the LTM Program with annual water level measurements and VC analysis during the expanded sampling events to serve as an additional upgradient point of compliance.

Monitoring wells GSSP-MW0028 (5-15 ft bls) and GSSP-MW0054 (25-35 ft bls) are located downgradient of monitoring wells GSSP-MW0019 and GSSP-MW0020 and are recommended to be added to the expanded sampling events for VC analysis. Monitoring well GSSP-MW0028 is also recommended to be added to the list of annual groundwater level measurements. Monitoring well GSSP-MW0028 had a VC exceedance of 2.0 µg/L the last time it was sampled in 2009. Monitoring well GSSP-MW0054 had three non-detectable VC analyses before being removed from the sampling program in 2016; however, this location has the same screen interval depth as upgradient monitoring well GSSP-MW0020, and the VC concentration is recommended

to be analyzed again to confirm the downgradient VC concentration in the intermediate aquifer zone.

The annual LTM sampling frequency is recommended to continue with an expanded sampling event every five years. The next sampling event, scheduled for November 2024, will be the five-year expanded sampling event and will include water level measurements at 37 monitoring wells and groundwater samples from 28 monitoring wells.

SPACE STATION PROCESSING FACILITY

Un-Ionized ammonia concentrations were calculated using the State of Florida DEP un-ionized ammonia calculator with analyzed total ammonia concentrations and groundwater sampling parameters. The un-ionized ammonia concentrations at SSPF were compared with the alternative State of Florida GCTL. Discontinuing groundwater LTM at SSPF is recommended since the calculated un-ionized ammonia concentrations (except the concentration at monitoring well SSPF-MW0019) are below the alternative GCTL for un-ionized ammonia, and the total ammonia concentrations are below the total ammonia GCTL at SSPF-MW0019.

FUEL STORAGE AREA #1 UNDERGROUND STORAGE TANK (BUILDING 1044)

Annual LTM sampling is recommended to continue during alternating wet and dry seasons. Monitoring wells FSA1-MW0012R, FSA1-MW0014, and FSA1-MW0028 are recommended to be removed from the LTM Program for collection of groundwater samples based on concentrations below GCTLs for the past two or more consecutive sampling events. Monitoring wells FSA1-MW0012R and FSA1-MW0014 are located upgradient of the source area with a historically consistent groundwater flow pattern at the site. Monitoring well FSA1-MW0028 is located downgradient and has the same screen interval depth as monitoring well FSA1-MW0027, which remains in the LTM Program to monitor the intermediate zone downgradient of the former source area. Monitoring well FSA1-MW0019 is recommended to be added to the sampling list as a downgradient monitoring well to FSA1-MW0017A. The next sampling event is recommended to include 18 water level measurements and eight groundwater samples analyzed for isopropylbenzene and select polynuclear aromatic hydrocarbons (PAHs) (1-methylnaphthalene and 2-methylnaphthalene). The next sampling event at FSA1 is scheduled for May 2024.

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1. INTRODUCTION

The National Aeronautics and Space Administration (NASA), through its Environmental Assurance Branch, is managing the cleanup of 12 sites in the Industrial Area (IA) of Kennedy Space Center (KSC), Florida, through a Long-Term Monitoring (LTM) Program. Groundwater sampling was conducted in 2023 by AECOM Technical Services, Inc. (AECOM) under Contract 80KSC019D0010, Task Order 80KSC019F0071. This report presents the activities, findings, and recommendations from the 2023 IA LTM Program. The 12 sites included in the IA LTM Program consist of one Potential Release Location (PRL) and 11 Solid Waste Management Units (SWMUs):

- Ransom Road Landfill (RRLF) – SWMU 003
- Building M7-0505 Treatment Tank Area (M505) – SWMU 039
- Operations and Checkout Building (O&C) – SWMU 076
- Vertical Processing Facility (VPF) – SWMU 077
- Environmental Health Facility (EHF) – SWMU 079
- Kennedy, Athletic, Recreation, and Social Park 1 (KARS Park 1) – SWMU 084
- Engineering Development Laboratory (EDL) – SWMU 085
- Launch Equipment Test Facility (LETF) – SWMU 091
- Mobil Service Station (MOBIL) – SWMU 093
- General Services Administration Seized Property (GSSP) – SWMU 095
- Space Station Processing Facility (SSPF) – SWMU 098
- Fuel Storage Area #1 Underground Storage Tank [Building 1044] (FSA1) – PRL 157

The locations of the sites included in the NASA IA LTM Program are depicted on **Figure 1-1**. Sampling activities, findings, and recommendations for the individual IA sites sampled in 2023 are included as **Section 2** through **Section 4** and **Section 6**. Un-ionized ammonia concentrations were calculated at SSPF to evaluate the calculated concentrations against the alternative Groundwater Cleanup Target Level (GCTL) for un-ionized ammonia. Calculations and recommendations for SSPF are included as **Section 5**.

1.1 PROJECT BACKGROUND

LTM has been approved by FDEP for the sites included in the NASA IA LTM Program. The primary objective of the IA LTM Program is to provide NASA with the necessary information to monitor progress and inform decisions toward cleanup goals for each site and provide analytical results to the FDEP as required by KSC's Corrective Action Management Plan (NASA 2006). The 2023 IA LTM Program work was conducted in accordance with the 2021-2022 IA LTM Report (AECOM 2023) and KSCRT decisions from the April and June 2023 meetings (**Appendix A**).

NASA IA LTM sites generally fall under two site types:

- Sites that have recently completed active remediation and are being monitored for contaminant rebound through annual sampling.
- Mature sites, which have been in the LTM Program for several years, that are approved for biennial, or less frequent, groundwater sampling.

1.2 FACILITY LOCATIONS

KSC is located on the northern portion of Merritt Island, between the Indian River to the west and the Banana River to the east. The IA LTM Program sites, depicted on **Figure 1-1**, are located at KSC, except for FSA1, which is located to the east at Cape Canaveral Space Force Station (CCSFS). At KSC, the sites are spread out with six sites (M505, O&C, EDL, LETF, SSPF, and MOBIL) located within the IA, one site (EHF) located north of the IA, one site (VPF) located southeast of the IA, and two sites (RRLF and GSSP) located west of the IA. KARS Park 1 is located approximately 5 miles south of the KSC boundary and east of State Road 3 on Merritt Island.

1.3 CLIMATE

The climate at KSC is typically pleasant with high temperatures in the range of 70 degrees Fahrenheit to 85 degrees Fahrenheit for 7 months out of the year. July is the hottest month with an average high temperature of 90.5 degrees Fahrenheit. The highest humidity occurs in July and August. The annual mean precipitation along the east coast of Central Florida in Brevard County is 55.09 inches based on precipitation records (2000-2023) maintained by the National Weather Service (NWS). Precipitation varies seasonally with the wet season occurring between May and October and the rest of year being relatively dry. In 2023, a higher-than-average total of 65.10 inches of rainfall was recorded (National Oceanic and Atmospheric Administration, NWS Forecast Office, Melbourne, Florida).

1.4 PURPOSE

This report presents the results from the 2023 NASA IA LTM Program field activities which included the sampling of four IA LTM sites (KARS Park 1, LETF, GSSP, and FSA1) and calculations for an alternative State of Florida GCTL for SSPF. Due to the project contract ending in 2023, this report presents one year of LTM activities instead of the two-year timeframe presented in previous reports. Based on the analytical results and calculations, conclusions and recommendations are included for future IA LTM activities at the five sites.

Recommendations for the four IA LTM sites sampled in 2023 were presented to the KSCRT in February 2024. Recommendations for SSPF were presented as a basket item by NASA during the April 2024 KSCRT meeting. Minutes from the KSCRT meetings are included in **Appendix A**.

1.5 FIELD SAMPLING ACTIVITIES

Performance of routine LTM sampling at the IA LTM sites provides the data necessary to evaluate the status of contaminants of concern (COCs) at each site. Groundwater sampling activities conducted in 2023 followed the KSC Sampling and Analysis Plan (SAP) (Geosyntec 2017), recommendations in the 2021-2022 LTM Report, and KSCRT decisions during the April and June 2023 meetings.

At the onset of each scheduled LTM sampling event and prior to collection of samples, predetermined monitoring wells were vented to allow for atmospheric equilibration. Once stabilized, depth to water levels were measured in select monitoring wells and groundwater elevations were calculated to determine the groundwater gradient and flow direction of the various site aquifers. Water levels in each monitoring well were measured to the nearest 0.01 foot (ft) using an electronic water level meter. Measurements were recorded from a permanent point identified on the top of each monitoring well casing, typically the northernmost point, for consistency. Groundwater elevations were calculated by subtracting the measured depth to water from the surveyed top of casing (TOC) elevation relative to the North American Vertical Datum of 1988 (NAVD88). Additionally, observations of the condition of the monitoring wells, surrounding vegetation, and biological hazards were noted.

Site-specific laboratory kits for LTM, including coolers and sample bottleware, were provided by Eurofins Environment Testing Southeast, LLC (Eurofins). Immediately following bottleware labeling, sample collection, and logging on the chain-of-custody, each sample was placed on ice. Samples were delivered to Eurofins directly by AECOM field staff or transported from KSC via a laboratory courier. Before transporting samples from KSC to Eurofins, sample coolers were packed with fresh ice. If the samples were relinquished to a laboratory courier, the exchange was noted on the chain-of-custody and the coolers were custody-sealed to maintain sample integrity during transit.

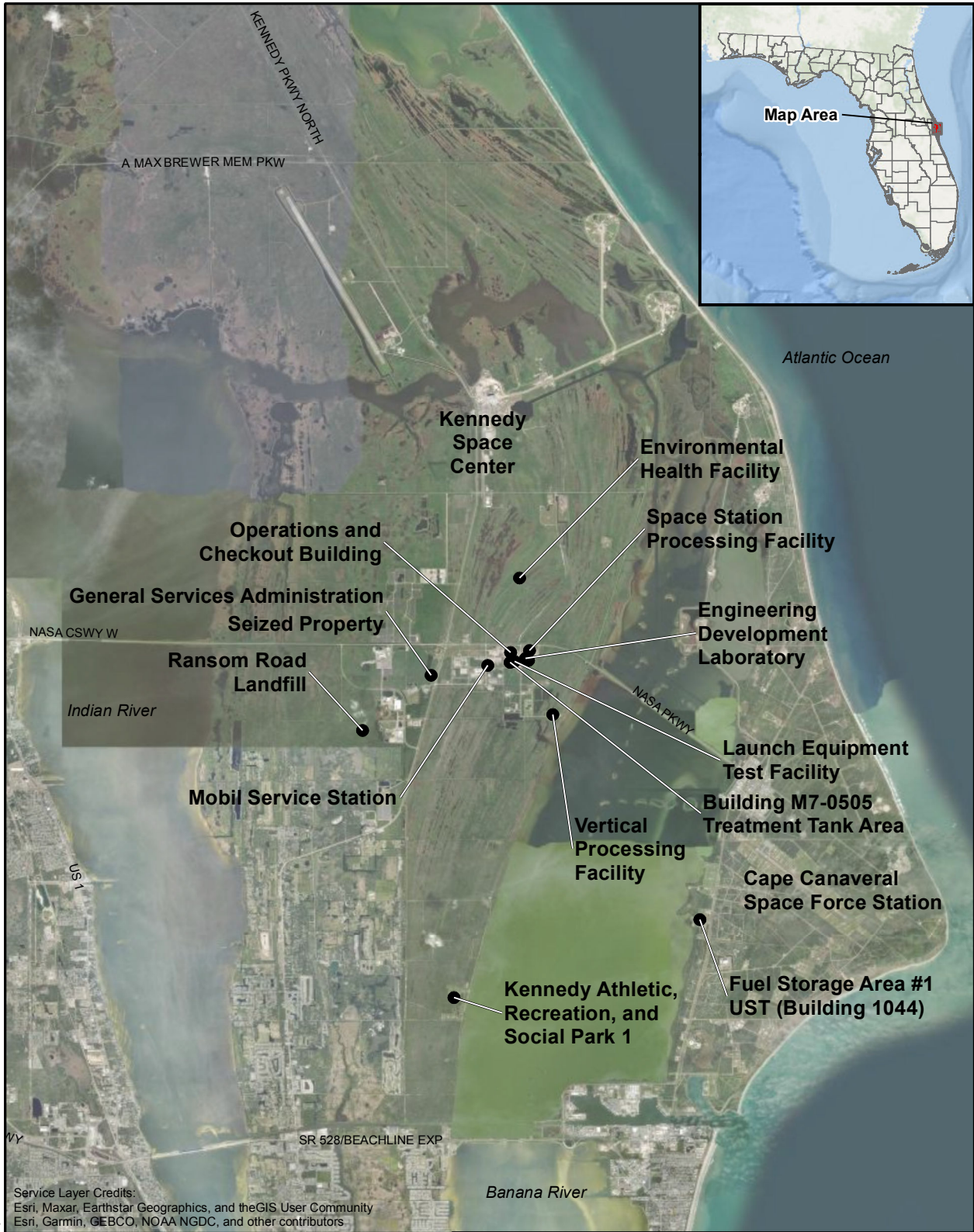
During purging of monitoring wells, geochemical parameters consisting of pH, specific conductivity, turbidity, dissolved oxygen, temperature, oxidation-reduction potential, and salinity were monitored and recorded. Samples were collected once the geochemical parameters reached stabilization in accordance with FDEP Standard Operating Procedures (FDEP 2017) and the SAP. Daily field activity logs are included in **Appendix B**. Groundwater sampling logs, which include the geochemical data, are included in **Appendix C**.

Each IA LTM site sampled in 2023 was sampled using low-flow sampling techniques, where each monitoring well was purged and sampled with a peristaltic pump and high-density polyethylene tubing. The sample tubing was placed within the top 1 foot of the water column at each shallow monitoring well and at the mid-point of the monitoring well screen at each intermediate and deep monitoring well to obtain a representative groundwater sample of aquifer conditions.

The KSCRT created the KSC Remediation Information System (RIS) so that contractors gathering environmental data could upload their data to the Electronic Data Exchange. Contractors are responsible for creating KSC Electronic Data Deliverables (KEDDs). A completion ticket is issued to the contractor after a successful KEDD upload. Upon receipt and validation of the 2023 analytical data from the laboratory, data were formatted and uploaded into RIS. Once the KEDD site-specific fields were populated, these records were uploaded into the RIS database. RIS completion tickets for 2023 groundwater sampling activities are included in **Appendix D**. Laboratory analytical data from these events can be found in **Appendix E** (electronic copies only).

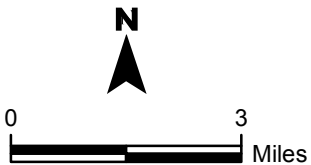
Purge water generated during sampling was containerized in 55-gallon steel drums staged on spill containment pallets at the Components Cleaning Facility. The storage drums of purge water were sampled at the end of each LTM sampling event and characterized for disposal. Upon receipt, analytical data were provided to the NASA Remediation Project Manager along with an inventory of the drums for disposal. Investigation-derived waste (IDW) inventory logs are provided as **Appendix F**.

Analytes detected in groundwater at each site were compared to the State of Florida GCTLs and Natural Attenuation Default Concentration (NADC) levels established by Chapter 62-777, Florida Administrative Code. Mann-Kendall trend analyses were completed for GSSP and SSPF, and the reports are provided in **Appendix G**. Data analysis and recommendations for each site are detailed in site-specific sections of this report.



Legend

- IA LTM Site Location



**FIGURE 1-1
 IA LTM Site Locations**

2023 Industrial Area Long Term Monitoring
 NASA Kennedy Space Center, Florida

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2. KENNEDY ATHLETIC, RECREATION, AND SOCIAL PARK 1

This section provides a summary of the KARS Park 1 Location of Concern (LOC) 9 site (SWMU 084). Refer to **Figure 2-1** for a site map.

2.1 SITE DESCRIPTION AND HISTORY

The KARS Park 1 site is located on East Hall Road, approximately 2.5 miles east of State Road 3, and approximately 5 miles south of KSC on Merritt Island. The 135-acre park is utilized by current and former NASA personnel as a recreational facility that includes picnic areas; tent and recreational vehicle camp sites; tennis, volleyball, and basketball courts; softball fields; and a marina with a boat ramp.

Eleven LOCs were identified at KARS Park 1 during the 2005 Resource Conservation and Recovery Act Facility Investigation (Tetra Tech 2005). Since then, two LOCs remain (LOC 7 and LOC 9). Arsenic contaminated groundwater was identified at LOC 7, a former bonfire area, where fire-starting chemicals and unwanted commodities were burned. Lead contamination was identified at LOC 9, a collection of former rifle, skeet, and pistol ranges that have been inactive since 2003 (NASA 2008).

A 2005 RFI identified accumulated lead shot and spent skeet targets as a potential for release of contaminants at LOC 9. The RFI confirmed polynuclear aromatic hydrocarbon (PAH) and lead-impacted soils exceeding soil cleanup target levels (SCTLs), and groundwater at concentrations exceeding the GCTL and KSC background level (Tetra Tech 2005).

Based on the RFI, the impacted soils at LOC 9 were removed during a series of soil interim measures (IMs). PAH-impacted soils were addressed during Phase 1 of the soil IM between December 2004 and May 2005. Lead-impacted soils were addressed during Phases 2 and 3 of the Soil IM between June 2007 and February 2008. No further action (NFA) for soil at LOC 9 was achieved in 2008 following the completion of successful excavation activities (NASA 2008).

As part of the 2005 RFI, a risk evaluation was conducted, which determined that groundwater at LOC 9 posed an unacceptable human health risk if it was used as a potable water source. A Corrective Measures Study was performed in 2007 to determine the appropriate remedy for the contaminated groundwater (Tetra Tech 2007). The remedy included LTM sampling of 12 monitoring wells at LOC 9, which began in 2008 on an annual schedule. In 2013, the sampling program changed to biennial groundwater sampling of three monitoring wells due to decreasing COC concentrations in the other nine monitoring wells below the GCTL (Tetra Tech 2013). LOC 9 changed to a 5-year sampling schedule after the July 2015 sampling event (Jacobs-CORE 2017).

Monitoring wells KP1-MW0003 and KP1-MW0035 were removed from the LTM schedule following two consecutive sampling events below the GCTL in November 2020 and September

2021. Lead concentrations were below the GCTL at monitoring well KP1-MW0022 in May 2022 and a confirmation event was recommended for May 2023 to obtain two annual consecutive events below the GCTL. Monitoring well KP1-MW0017, a LTM monitoring well for groundwater level measurements only, was found destroyed during the May 2023 sampling event and was properly abandoned in April 2024. Abandonment details are to be included in the 2024 well abandonment and installation report by HydroGeoLogic.

2.2 FIELD ACTIVITIES

A confirmation sampling event was performed in May 2023 following the May 2022 sampling event with no GCTL exceedances. Groundwater levels were measured at 13 monitoring wells, and a groundwater sample was collected from monitoring well KP1-MW0022. The groundwater at monitoring wells KP1-MW0003 and KP1-MW0015 was above the top of casing, and monitoring well KP1-MW0017 was found destroyed, therefore, groundwater level measurements were not collected from these three monitoring wells. The following table shows the network of monitoring wells used for groundwater level measurements and sampling at LOC 9.

Well ID	Screen Interval (ft bls)	Analysis
KP1-MW0001	2-12	WL
KP1-MW0003	2-12	WL (>TOC)
KP1-MW0004	2-12	WL
KP1-MW0005	2-12	WL
KP1-MW0015	2-12	WL (>TOC)
KP1-MW0016	2-12	WL
KP1-MW0017	2-12	Destroyed
KP1-MW0019	2-12	WL
KP1-MW0022	2-12	WL + Lead
KP1-MW0023	2-12	WL
KP1-MW0024	2-12	WL
KP1-MW0027	2-12	WL
KP1-MW0028	2-12	WL
KP1-MW0035	2-12	WL
KP1-MW0036	2-12	WL
KP1-MW0037	2-12	WL

ID = identification

Lead = total lead analysis by Method 6020

MW = monitoring well

TOC = top of casing

WL = water level measurement

The groundwater sample collected during the May 2023 field event at KARS Park 1 LOC 9 was analyzed for total lead by Method 6020. Below are the respective GCTLs and NADCs for the COC present at KARS Park 1 LOC 9.

COC	GCTL (µg/L)	NADC (µg/L)
Total lead	15	150

2.3 WATER LEVEL COLLECTION AND GROUNDWATER FLOW DIRECTION

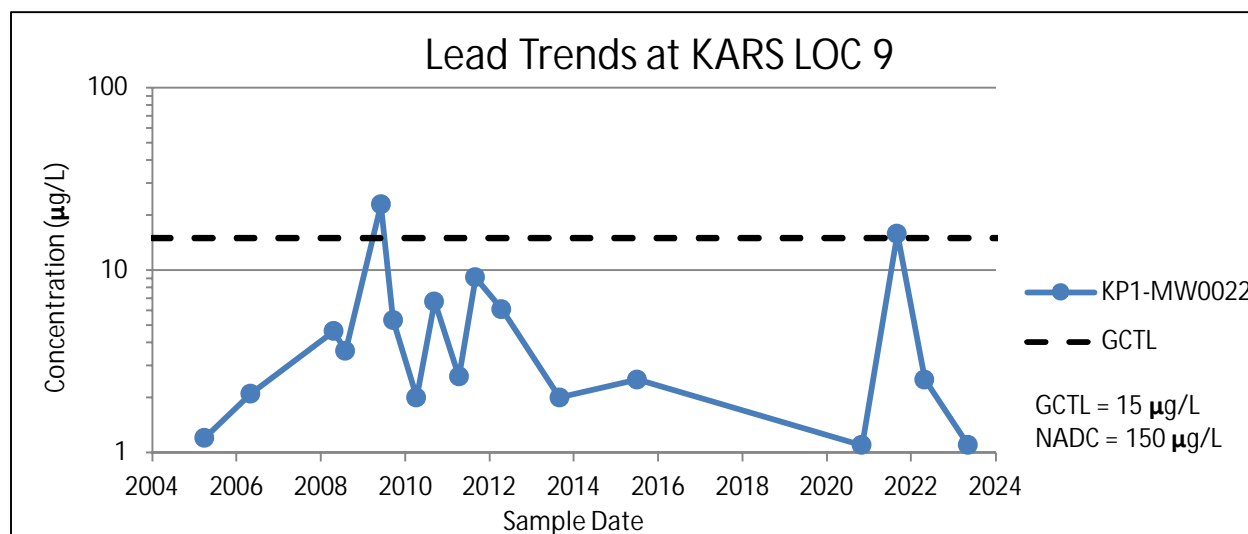
Groundwater levels collected during the May 2023 sampling event were used to calculate groundwater elevations presented in **Table 2-1**. The groundwater elevations were used to determine the contours and flow direction for the shallow aquifer zone (2 ft below land surface [bls] to 12 ft bls) shown on **Figure 2-2**. The shallow groundwater flow direction at LOC 9 in May 2023 was generally toward the southeast with a small area of northern groundwater flow near monitoring well KP1-MW0028. The historical groundwater flow direction at LOC 9 is east-southeast.

2.4 ANALYTICAL RESULTS

Lead concentrations in groundwater were below laboratory detection limits and the GCTL at KP1-MW0022 in May 2023. A summary of the analytical results from 2003 to present is presented in **Table 2-2**. Analytical results are depicted on **Figure 2-3**.

2.5 TREND ANALYSIS

Concentrations of lead at LOC 9 have decreased significantly since 2003. The following chart shows lead concentrations at KP1-MW0022 since it was installed in 2005.



2.6 CONCLUSION AND RECOMMENDATION

Total lead concentrations at monitoring well KP1-MW0022 were below the GCTL during two consecutive annual sampling events in May 2022 (2.5 U micrograms per liter [µg/L]) and May 2023 (1.1 U µg/L); therefore, groundwater LTM at KARS Park 1 LOC 9 is recommended to discontinue.

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Table 2-1
Kennedy Athletic, Recreation, and Social Park 1, Location of Concern 9 - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

LOC 9 SHALLOW WELL ID:	KP1-MW0001		KP1-MW0003		KP1-MW0004	
Screen Interval (ft bls):	2 - 12		2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	4.96		2.82		4.56	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	5.31	-0.35	2.20	0.62	5.08	-0.52
November 2020	3.15	1.81	>TOC	Not Measured	3.09	1.47
September 2021	4.58	0.38	2.01	0.81	4.25	0.31
May 2023	3.18	1.78	>TOC	Not Measured	3.39	1.17

LOC 9 SHALLOW WELL ID:	KP1-MW0005		KP1-MW0015		KP1-MW0016	
Screen Interval (ft bls):	2 - 12		2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	4.79		3.01		4.21	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	5.23	-0.44	2.25	0.76	3.58	0.63
November 2020	3.25	1.54	0.00	3.01	1.15	3.06
September 2021	4.53	0.26	2.03	0.98	2.78	1.43
May 2023	3.27	1.52	>TOC	Not Measured	1.81	2.40

LOC 9 SHALLOW WELL ID:	KP1-MW0017		KP1-MW0018		KP1-MW0019	
Screen Interval (ft bls):	2 - 12		2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	4.04		4.94		2.34	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	3.15	0.89	5.12	-0.18	2.79	-0.45
November 2020	0.87	3.17	Destroyed		1.00	1.34
September 2021	2.51	1.53	Abandoned		2.29	0.05
May 2023	Destroyed		--		1.22	1.12

LOC 9 SHALLOW WELL ID:	KP1-MW0022		KP1-MW0023		KP1-MW0024	
Screen Interval (ft bls):	2 - 12		2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	2.73		4.82		2.18	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	3.35	-0.62	4.52	0.30	2.68	-0.50
November 2020	1.60	1.13	2.55	2.27	0.95	1.23
September 2021	2.63	0.10	3.70	1.12	2.15	0.03
May 2022	3.38	-0.65	Not Measured		Not Measured	
May 2023	1.84	0.89	3.20	1.62	1.19	0.99

LOC 9 SHALLOW WELL ID:	KP1-MW0027		KP1-MW0028		KP1-MW0035	
Screen Interval (ft bls):	2 - 12		2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	5.57		2.64		1.99	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	5.37	0.20	3.16	-0.52	1.25	0.74
November 2020	3.32	2.25	1.00	1.64	0.62	1.37
September 2021	4.43	1.14	2.97	-0.33	1.88	0.11
May 2023	3.74	1.83	0.10	2.54	0.61	1.38

LOC 9 SHALLOW WELL ID:	KP1-MW0036		KP1-MW0037	
Screen Interval (ft bls):	2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	2.10		4.98	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	2.10	0.00	5.41	-0.43
November 2020	0.27	1.83	3.49	1.49
September 2021	1.92	0.18	4.49	0.49
May 2023	0.65	1.45	3.49	1.49

Notes:

bls = below land surface

BTOC = below top of casing

ft = feet

KP1 = Kennedy Athletic, Recreation, and Social Park 1

LOC = Location of Concern

MW = monitoring well

NAVD88 = North American Vertical Datum of 1988

TOC = top of casing

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Table 2-2
KARS Park 1, Location of Concern 9 - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Metals Analysis by Method SW846 6010D</i>	
Analyte			TOTAL LEAD	DISSOLVED LEAD
FDEP GCTLs (µg/L)			15	15
FDEP NADCs (µg/L)			150	150
Location ID	Sample Date	Screened Interval (ft bls)		
LOC 9: KP1-MW0001	12/30/2003	2 - 12	25.1	6.9
	5/4/2006	2 - 12	7.2	1.7 U
LOC 9: KP1-MW0003	12/30/2003	2 - 12	188	41.5
	4/19/2004	2 - 12	1,650	39.2
	5/5/2006	2 - 12	266	3.2 I
	4/23/2008	2 - 12	4.2 I	2.2 I
	8/5/2008	2 - 12	20.0	2.0 U
	6/10/2009	2 - 12	47.6	31.0
	9/23/2009	2 - 12	4.4 I	3.4 I
	4/14/2010	2 - 12	3.4 J	2.0 U
	9/15/2010	2 - 12	6.2 J	2.0 U
	4/19/2011	2 - 12	19.0	13.0
	9/6/2011	2 - 12	2.0 U	2.0 U
	4/22/2012	2 - 12	7.7 I	2.0 U
	9/5/2013	2 - 12	4.2 I	2.0 I
	7/17/2015	2 - 12	17.0	NA
11/13/2020	2 - 12	3.2 I	NA	
9/16/2021	2 - 12	13.9	NA	
LOC 9: KP1-MW0004	2/20/2004	2 - 12	55.7	8.7
	2/24/2004	2 - 12	82.2	50.3
	4/23/2008	2 - 12	2.8 I	2.9 I
	8/5/2008	2 - 12	2 U	2 I
	6/10/2009	2 - 12	2 I	2.1 I
	9/23/2009	2 - 12	2 U	2.5 I
	4/14/2010	2 - 12	2.1 J	2 U
	9/15/2010	2 - 12	2 U	2 U
	4/19/2011	2 - 12	2 U	2 U
9/6/2011	2 - 12	2 U	2 U	
LOC 9: KP1-MW0005	2/20/2004	2 - 12	24.4	12.3
	2/24/2004	2 - 12	28.7	19.4
	5/4/2006	2 - 12	42.1	32.5
	4/24/2008	2 - 12	2.6 I	2.3 I
	8/6/2008	2 - 12	2 U	2 U
	6/10/2009	2 - 12	2 U	2 U
	9/23/2009	2 - 12	2 U	2 U
	4/14/2010	2 - 12	2 U	2 U
	9/15/2010	2 - 12	2 U	2 U
	4/19/2011	2 - 12	2 U	2 U
9/6/2011	2 - 12	2 U	2 U	

Table 2-2
KARS Park 1, Location of Concern 9 - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Metals Analysis by Method SW846 6010D	
			TOTAL LEAD	DISSOLVED LEAD
Analyte				
FDEP GCTLs (µg/L)			15	15
FDEP NADCs (µg/L)			150	150
Location ID	Sample Date	Screened Interval (ft bls)		
LOC 9: KPI-MW0006	2/20/2004	2 - 12	8.3	5
	2/24/2004	2 - 12	13.5	3.4 I
	5/4/2006	2 - 12	20.7	17.6
	4/24/2008	2 - 12	12.5	5.9
	8/6/2008	2 - 12	9.6	8
	6/10/2009	2 - 12	3 I	2.2 I
	9/23/2009	2 - 12	10.4	4 I
	4/14/2010	2 - 12	4.3 J	2 U
	9/15/2010	2 - 12	2.4 J	2 U
4/19/2011	2 - 12	2 U	2 U	
9/6/2011	2 - 12	2.8 I	2 U	
LOC 9: KPI-MW0015	3/29/2005	2 - 12	7.8	3.7 I
	5/5/2006	2 - 12	5.9	3.3 I
LOC 9: KPI-MW0016	3/30/2005	2 - 12	6.4	1.2 U
	5/5/2006	2 - 12	1.8 I	1.7 U
LOC 9: KPI-MW0017	3/30/2005	2 - 12	5.5	3.9 I
	5/5/2006	2 - 12	7	3 I
LOC 9: KPI-MW0018	3/30/2005	2 - 12	85.7	16.4
	5/3/2006	2 - 12	6.7	1.7 U
	4/23/2008	2 - 12	2.2 I	2.3 I
	8/5/2008	2 - 12	2 U	2 U
LOC 9: KPI-MW0019	3/29/2005	2 - 12	40.2	35.8
	5/6/2006	2 - 12	73.4	12.4
	4/23/2008	2 - 12	2.6 I	2.8 I
	8/6/2008	2 - 12	2 U	2 U
LOC 9: KPI-MW0022	3/30/2005	2 - 12	1.2 U	1.2 U
	5/6/2006	2 - 12	2.1 I	1.7 U
	4/24/2008	2 - 12	4.6 I	3.2 I
	8/6/2008	2 - 12	3.6 I	2 U
	6/10/2009	2 - 12	22.8	16.5
	9/23/2009	2 - 12	5.3 I	6.2 I
	4/14/2010	2 - 12	2.0 U	2.0 U
	9/15/2010	2 - 12	6.7 J	6.4 J
	4/19/2011	2 - 12	2.6 I	3.0 I
	9/6/2011	2 - 12	9.1 I	7.9 I
	4/22/2012	2 - 12	6.1 I	2.0 U
	9/5/2013	2 - 12	2.0 I	2.0 I
	7/15/2015	2 - 12	2.5 U	NA
	11/13/2020	2 - 12	1.1 U	NA
	9/16/2021	2 - 12	15.8	NA
5/12/2022	2 - 12	2.50 U	NA	
5/26/2023	2 - 12	1.1 U	NA	
LOC 9: KPI-MW0023	5/25/2005	1.5 - 11.5	2.3 I	1.2 U
	5/3/2006	1.5 - 11.5	1.7 U	1.7 U
LOC 9: KPI-MW0024	5/25/2005	2 - 12	1.2 U	1.2 U
	5/6/2006	2 - 12	3.1 I	2.4 I
	4/23/2008	2 - 12	2.5 I	2.4 I
	8/6/2008	2 - 12	3.8 I	2.7 I

Table 2-2
KARS Park 1, Location of Concern 9 - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Metals Analysis by Method SW846 6010D	
Analyte			TOTAL LEAD	DISSOLVED LEAD
FDEP GCTLs (µg/L)			15	15
FDEP NADCs (µg/L)			150	150
Location ID	Sample Date	Screened Interval (ft bls)		
LOC 9: KPI-MW0025	5/25/2005	8 - 18	1.2 U	1.2 U
	5/4/2006	8 - 18	1.7 U	1.7 U
LOC 9: KPI-MW0026	5/25/2005	8 - 18	1.2 U	1.2 U
	5/4/2006	8 - 18	1.7 I	1.7 U
LOC 9: KPI-MW0027	5/25/2005	2 - 12	1.4 I	1.2 U
	5/3/2006	2 - 12	5	3.1 I
LOC 9: KPI-MW0028	5/25/2005	2 - 12	1.2 I	1.6 I
	5/6/2006	2 - 12	3.4 I	3.2 I
LOC 9: KPI-MW0035	4/23/2008	2 - 12	3.7 I	3.4 I
	8/6/2008	2 - 12	3.0 I	2.0 U
	6/10/2009	2 - 12	3.1 I	2.0 U
	9/23/2009	2 - 12	3.5 I	2.7 I
	4/14/2010	2 - 12	2.0 U	2.2 J
	9/15/2010	2 - 12	2.0 U	2.0 U
	4/19/2011	2 - 12	2.0 U	2.0 U
	9/6/2011	2 - 12	2.0 U	2.0 U
	4/22/2012	2 - 12	3.9 I	2.0 U
	9/5/2013	2 - 12	6.1 I	2.0 I
	7/15/2015	2 - 12	2.5 U	NA
11/13/2020	2 - 12	3.4 I	NA	
9/16/2021	2 - 12	14.6	NA	
LOC 9: KPI-MW0036	4/23/2008	2 - 12	2.1 I	2.8 I
	8/5/2008	2 - 12	2 I	2 U
LOC 9: KPI-MW0037	4/23/2008	2 - 12	2.1 U	2.3 I
	8/5/2008	2 - 12	2 U	2 U
LOC 9: KPI-MW0038	4/23/2008	20 - 25	2.1 U	3.5 I
	8/5/2008	20 - 25	2 U	2 U

Notes:

FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table 1 (2005)

FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code, Table V (2005)

ft bls = feet below land surface

LOC = location of concern

KPI = Kennedy Athletic, Recreation, and Social Park 1

MW = monitoring well

NA = Not Analyzed

Results and screening criteria presented in µg/L (micrograms per liter)

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

Highlighted cell indicates an exceedance of FDEP NADCs

I = Analyte greater than or equal to the method detection limit, but less than the practical quantitation limit

J = Indicates an estimated value

U = Analyte not detected





The numeric value presented for non-detects is the sample-specific reporting detection limit

Long-Term Groundwater Monitoring Report
Industrial Area
Revision: 0
July 2024

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- Legend**
-  Shallow Monitoring Well (Gray Icon - Water Level Only)
 -  Monitoring Well (Non-LTM)
 -  Abandoned Monitoring Well
 -  BUILDINGS

- Notes:**
- (2-12) = Monitoring well screen interval in feet below land surface
 - Aerial Source: FDOT 2018
 - KARS Park 1 = Kennedy Athletic, Recreation, and Social Park 1
 - LTM = Long Term Monitoring
 - SWMU = Solid Waste Management Unit

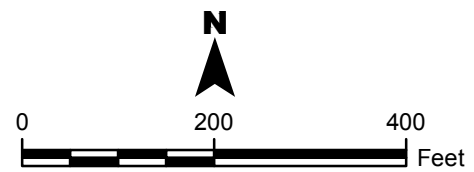


FIGURE 2-1
LOC 9 Site Map
 2023 - Industrial Area Long Term Monitoring
 KARS Park 1 (KP1)
 SWMU 084
 NASA Kennedy Space Center, Florida

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Legend

- Shallow Monitoring Well (2-12 feet bls)
- Approximate Direction of Groundwater Flow
- Groundwater Contour (NAVD88 feet)
- (2.40) Groundwater Elevation Contour (NAVD88 feet)

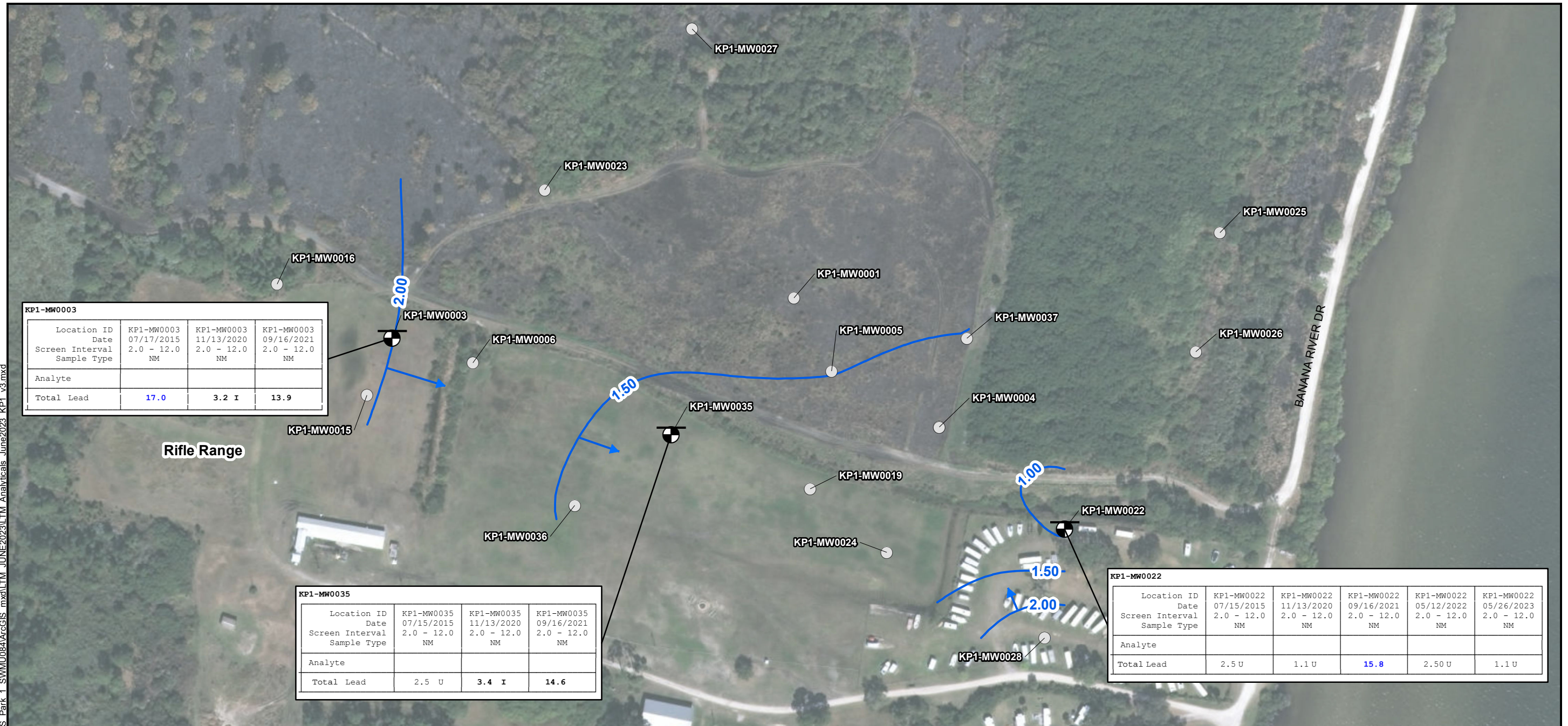
- Notes:**
- Vertical Datum is NAVD88 (US Feet)
 - Monitoring wells were gauged on May 26, 2023
 - Groundwater Contour Interval = 0.50 feet
 - bls = Below land surface
 - NM = Not Measured
 - KARS Park 1 = Kennedy Athletic, Recreation, and Social Park 1
 - SWMU = Solid Waste Management Unit
 - Aerial Source: FDOT 2018



FIGURE 2-2
LOC 9 Groundwater Elevation Map - May 2023

2023 - Industrial Area Long Term Monitoring
 KARS Park 1 (KP1)
 SWMU 084
 NASA Kennedy Space Center, Florida

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KP1-MW0003			
Location ID	KP1-MW0003	KP1-MW0003	KP1-MW0003
Date	07/17/2015	11/13/2020	09/16/2021
Screen Interval	2.0 - 12.0	2.0 - 12.0	2.0 - 12.0
Sample Type	NM	NM	NM
Analyte			
Total Lead	17.0	3.2 I	13.9

KP1-MW0035			
Location ID	KP1-MW0035	KP1-MW0035	KP1-MW0035
Date	07/15/2015	11/13/2020	09/16/2021
Screen Interval	2.0 - 12.0	2.0 - 12.0	2.0 - 12.0
Sample Type	NM	NM	NM
Analyte			
Total Lead	2.5 U	3.4 I	14.6

KP1-MW0022					
Location ID	KP1-MW0022	KP1-MW0022	KP1-MW0022	KP1-MW0022	KP1-MW0022
Date	07/15/2015	11/13/2020	09/16/2021	05/12/2022	05/26/2023
Screen Interval	2.0 - 12.0	2.0 - 12.0	2.0 - 12.0	2.0 - 12.0	2.0 - 12.0
Sample Type	NM	NM	NM	NM	NM
Analyte					
Total Lead	2.5 U	1.1 U	15.8	2.50 U	1.1 U

Legend

- Shallow Monitoring Well (2-12 feet bls)
- Non-LTM, No Sample Results
- Approximate Direction of Groundwater Flow
- Groundwater Contour (NAVD88 feet)

Notes:

1. LTM = Long Term Monitoring
2. MW = Monitoring Well
3. NM = Normal Sample
4. SWMU = Solid Waste Management Unit
5. All results and screening criteria presented in µg/L.
6. I = Result is greater than or equal to the Method Detection Limit (MDL) but less than the Practical Quantitation Limit (PQL).
7. U = Result was below the laboratory MDL.
8. FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777, F.A.C.
9. **Bolded** results indicate the presence of an analyte at the specified concentration.
10. **Blue** font indicates an exceedance of FDEP GCTLs.
11. Aerial Source: ESRI 2018.
12. Depth of monitoring well screen interval is presented in feet below land surface.

Analyte	GCTL
Total Lead	15



FIGURE 2-3
LOC 9 Groundwater Sampling Analytical Results

2023 - Industrial Area Long Term Monitoring
 KARS Park 1 (KP1)
 SWMU 084
 NASA Kennedy Space Center, Florida

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3. LAUNCH EQUIPMENT TEST FACILITY

This section provides a summary of the LETF site (SWMU 091). Refer to **Figure 3-1** for a site map.

3.1 SITE DESCRIPTION AND HISTORY

The LETF area is located south of the O&C Building and northwest of the intersection of East Avenue Southeast and 3rd Street Southeast. The LETF area is comprised of several large support structures and buildings, including the Supply, Shipping, and Receiving Warehouse/Payload Support Building, the LETF Shipping and Receiving Building, the Waste and Water Support Building, the Cryogenic Testing Laboratory, and other support facilities. Most of these facilities were constructed between 1963 and 1966. In 1976, the eastern portion of LETF was constructed to support launch equipment testing for the Space Shuttle Program (ARCADIS 2014).

During an RFI in 2006, vinyl chloride (VC) concentrations in groundwater exceeding GCTLs were detected in confirmatory samples. It was also determined during the assessment that the VC plume in the eastern portion of the site was separate from the plume at the M7-0505 Treatment Tank Area (SWMU 039). In 2010, additional assessment during the RFI indicated that the LETF VC plume was delineated (ARCADIS 2011). To address contaminant concentrations that exceeded GCTLs, monitored natural attenuation (MNA) of groundwater was selected to reduce VC concentrations (ARCADIS 2014).

The remedy included LTM sampling of four monitoring wells, which began in 2008 on a semi-annual schedule. In 2009, groundwater sampling results showed increasing VC concentrations at monitoring well LETF-MW0001. Based on the VC concentration increases, additional groundwater assessment was conducted, which found VC exceeding both the GCTL and NADC. LETF was then removed from the LTM Program for remedial action.

A Remedial Alternatives Evaluation was completed in 2010 and a Remedial Action Plan was presented to the KSCRT in 2011 (ARCADIS 2011), which recommended treatment of the VC plume area exceeding the NADC with an air sparge (AS) system. In 2012, the AS system began operation and groundwater monitoring was performed to monitor the effectiveness of the AS treatment. In 2013, VC groundwater concentration results across the site were below the NADC, and concentrations within the radius of influence of the AS system had fallen below the GCTL. In June 2013, the AS system was deactivated (ARCADIS 2014). The site was placed back into the LTM Program in 2014 to monitor VC concentrations. Annual groundwater sampling resumed at LETF in July 2015, and transitioned to the current biennial sampling schedule in 2018.

3.2 FIELD ACTIVITIES

Field activities were performed at LETF in May 2023. Groundwater levels were measured at 14 monitoring wells and samples from two monitoring wells were collected. The following table shows the network of monitoring wells used for groundwater level measurements and sampling at LETF.

Well ID	Screen Interval (ft bls)	Analysis
LETF-MW0001	22.5-27.5	WL + VC
LETF-MW0002	22.5-27.5	WL
LETF-MW0003	22.5-27.5	WL
LETF-MW0004	33.5-38.5	WL
LETF-MW0005	22.5-27.5	WL
LETF-MW0006	33.5-38.5	WL
LETF-MW0007	33.5-38.5	WL
LETF-MW0008	22.5-27.5	WL
LETF-MW0009	22.5-27.5	WL
LETF-MW0010	22.5-27.5	WL
LETF-MW0011	22.5-27.5	WL
LETF-PSB-MW0001I	22-27	WL + VC
LETF-PSB-MW0002I	22-27	WL
LETF-PSB-MW0003I	20-25	WL

ID = identification
 MW = monitoring well
 VC = vinyl chloride analysis by Method 8260
 WL = water level measurement

Groundwater samples collected during the May 2023 event were analyzed for VC by Method 8260. Below are the respective GCTL and NADC for the COC present at LETF.

COC	GCTL (µg/L)	NADC (µg/L)
VC	1	100

3.3 WATER LEVEL COLLECTION AND GROUNDWATER FLOW DIRECTION

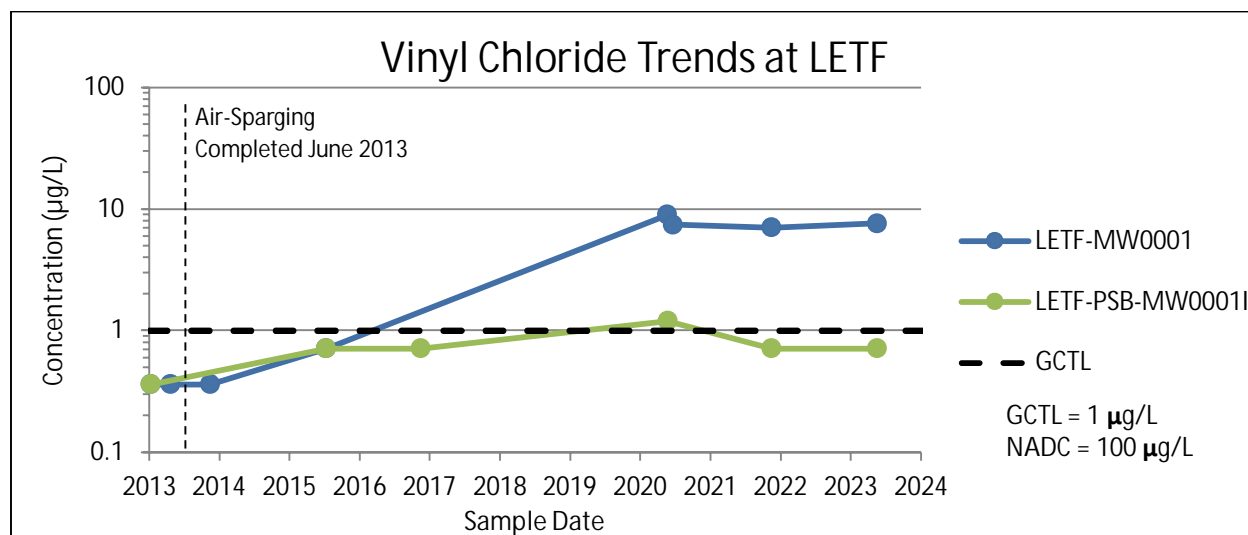
Groundwater levels collected during the May 2023 sampling event were used to calculate groundwater elevations presented in **Table 3-1**. Groundwater elevations were used to determine the contours and flow direction for the intermediate aquifer zone (20 ft bls to 38.5 ft bls), shown on **Figure 3-2**. The groundwater flow direction in May 2023 was concentrated toward the drainage ditch between the LETF facility and the prototype shop. The historical flow direction generally ranges from southeast to southwest.

3.4 ANALYTICAL RESULTS

VC concentrations exceeded the GCTL in monitoring well LETF-MW0001 (7.6 micrograms per liter [$\mu\text{g/L}$]) in May 2023. A summary of the current and historical analytical results is presented in **Table 3-2**. Analytical results are depicted on **Figure 3-3**.

3.5 TREND ANALYSIS

VC at monitoring well LETF-MW0001 was below detection limits through 2015 and was taken out of the sampling schedule, until the May 2020 event, when VC concentrations were found to be exceeding the GCTL and remain above the GCTL in 2023. The following trend chart shows the VC concentrations at select LETF monitoring wells since 2013.



3.6 CONCLUSION AND RECOMMENDATION

VC concentrations continue to exceed the GCTL at monitoring well LETF-MW0001; therefore, the biennial sampling frequency is recommended to continue at monitoring wells LETF-MW0001 and LETF-PSB-MW0001I with 14 groundwater level measurements. The addition of trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE) analysis is recommended to check for additional dechlorination byproduct concentrations at the site.

The following table shows the recommended monitoring wells for water level measurements and groundwater sampling for the next sampling event at LETF scheduled for November 2025.

Long-Term Groundwater Monitoring Report

Industrial Area

Revision: 0

July 2024

Well ID	Screen Interval (ft bls)	Analysis
LETf-MW0001	22.5-27.5	WL + Select VOCs
LETf-MW0002	22.5-27.5	WL
LETf-MW0003	22.5-27.5	WL
LETf-MW0004	33.5-38.5	WL
LETf-MW0005	22.5-27.5	WL
LETf-MW0006	33.5-38.5	WL
LETf-MW0007	33.5-38.5	WL
LETf-MW0008	22.5-27.5	WL
LETf-MW0009	22.5-27.5	WL
LETf-MW0010	22.5-27.5	WL
LETf-MW0011	22.5-27.5	WL
LETf-PSB-MW0001I	22-27	WL + Select VOCs
LETf-PSB-MW0002I	22-27	WL
LETf-PSB-MW0003I	20-25	WL

ID = identification

MW = monitoring well

Select VOCs = trichloroethene; cis-1,2-dichloroethene; and vinyl chloride analysis by Method 8260

WL = water level measurement

Table 3-1
Launch Equipment Test Facility - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

INTERMEDIATE WELL ID:	LETF-MW0001		LETF-MW0002		LETF-MW0003	
Screen Interval (ft bls):	22.5 - 27.5		22.5 - 27.5		22.5 - 27.5	
TOC Elevation (ft NAVD88):	9.55		9.48		9.36	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	8.31	1.24	8.12	1.36	8.15	1.21
November 2016	6.94	2.61	6.70	2.78	6.79	2.57
September 2017	6.33	3.22	6.18	3.30	6.16	3.20
November 2019	6.40	3.15	6.17	3.31	6.23	3.13
May 2020	6.93	2.62	6.81	2.67	Not Measured	
November 2021	5.45	4.10	5.34	4.14	5.27	4.09
May 2023	6.00	3.55	5.88	3.60	5.83	3.53

INTERMEDIATE WELL ID:	LETF-MW0004		LETF-MW0005		LETF-MW0006	
Screen Interval (ft bls):	33.5 - 38.5		22.5 - 27.5		33.5 - 38.5	
TOC Elevation (ft NAVD88):	9.55		9.68		6.80	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	8.31	1.24	8.40	1.28	5.70	1.10
November 2016	6.94	2.61	7.20	2.48	4.20	2.60
September 2017	6.28	3.27	6.40	3.28	3.55	3.25
November 2019	6.36	3.19	Not Measured		Not Measured	
May 2020	Not Measured		6.94	2.74	Not Measured	
November 2021	5.48	4.07	5.55	4.13	2.62	4.18
May 2023	5.97	3.58	6.13	3.55	3.17	3.63

INTERMEDIATE WELL ID:	LETF-MW0007		LETF-MW0008		LETF-MW0009	
Screen Interval (ft bls):	33.5 - 38.5		22.5 - 27.5		22.5 - 27.5	
TOC Elevation (ft NAVD88):	9.40		9.10		9.48	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	8.18	1.22	7.8	1.30	8.16	1.32
November 2016	6.90	2.50	6.37	2.73	6.77	2.71
September 2017	6.18	3.22	5.83	3.27	6.23	3.25
November 2019	6.23	3.17	5.85	3.25	6.23	3.25
May 2020	6.81	2.59	Not Measured		Not Measured	
November 2021	5.28	4.12	5.03	4.07	5.31	4.17
May 2023	5.83	3.57	5.53	3.57	5.89	3.59

INTERMEDIATE WELL ID:	LETF-MW0010		LETF-MW0011		LETF-PSB-MW0001I	
Screen Interval (ft bls):	22.5 - 27.5		22.5 - 27.5		22 - 27	
TOC Elevation (ft NAVD88):	9.65		8.63		8.86	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	8.37	1.28	7.44	1.19	7.58	1.28
November 2016	6.97	2.68	6.30	2.33	6.22	2.64
September 2017	6.42	3.23	5.38	3.25	5.57	3.29
November 2019	6.43	3.22	5.49	3.14	5.65	3.21
May 2020	Not Measured		Not Measured		6.15	2.71
November 2021	5.48	4.17	4.56	4.07	4.75	4.11
May 2023	6.06	3.59	5.10	3.53	5.27	3.59

INTERMEDIATE WELL ID:	LETF-PSB-MW0002I		LETF-PSB-MW0003I	
Screen Interval (ft bls):	22 - 27		20 - 25	
TOC Elevation (ft NAVD88):	6.72		7.25	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
July 2015	5.66	1.06	6.19	1.06
November 2016	4.22	2.50	4.88	2.37
September 2017	3.53	3.19	4.02	3.23
November 2019	3.64	3.08	4.13	3.12
May 2020	4.17	2.55	Not Measured	
November 2021	2.66	4.06	3.11	4.14
May 2023	3.16	3.56	3.68	3.57

Notes:

- bls = below land surface
- BTOC = below top of casing
- ft = feet
- LETF = Launch Equipment Test Facility
- MW = monitoring well
- NAVD88 = North American Vertical Datum of 1988
- TOC = top of casing

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Table 3-2
Launch Equipment Test Facility - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Volatile Organic Compounds (VOC) by Method 8260</i>
Analyte			VINYL CHLORIDE
FDEP GCTLs (µg/L)			1
FDEP NADCs (µg/L)			100
Location ID	Sample Date	Screened Interval (ft bls)	
LETf-MW0001	5/22/2007	22.5 - 27.5	180
	12/16/2008	22.5 - 27.5	25
	5/14/2009	22.5 - 27.5	140
	12/3/2009	22.5 - 27.5	170
	5/19/2010	22.5 - 27.5	160
	11/3/2010	22.5 - 27.5	86.1
	5/4/2011	22.5 - 27.5	77.5
	11/16/2011	22.5 - 27.5	89.4
	4/16/2012	22.5 - 27.5	0.36 U
	7/24/2012	22.5 - 27.5	0.36 U
	10/10/2012	22.5 - 27.5	0.36 U
	1/9/2013	22.5 - 27.5	0.36 U
	4/23/2013	22.5 - 27.5	0.36 U
	11/14/2013	22.5 - 27.5	0.36 U
	7/14/2015	22.5 - 27.5	0.71 U
	5/28/2020	22.5 - 27.5	9.0
	6/26/2020	22.5 - 27.5	7.4
	11/23/2021	22.5 - 27.5	7.0
	5/26/2023	22.5 - 27.5	7.6
LETf-MW0002	5/22/2007	22.5 - 27.5	4.8
	5/14/2009	22.5 - 27.5	14
	12/3/2009	22.5 - 27.5	10
	5/18/2010	22.5 - 27.5	12
	11/3/2010	22.5 - 27.5	10.9
	5/4/2011	22.5 - 27.5	11
	11/16/2011	22.5 - 27.5	13.7
	1/10/2013	22.5 - 27.5	2.4
	7/14/2015	22.5 - 27.5	0.71 U
	11/18/2016	22.5 - 27.5	1.2
	9/5/2017	22.5 - 27.5	0.71 U
	11/26/2019	22.5 - 27.5	0.41 U
	5/28/2020	22.5 - 27.5	0.76 I
	11/23/2021	22.5 - 27.5	0.71 U

**Table 3-2
Launch Equipment Test Facility - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results**

Category			<i>Volatile Organic Compounds (VOC) by Method 8260</i>
Analyte			VINYL CHLORIDE
FDEP GCTLs (µg/L)			1
FDEP NADCs (µg/L)			100
Location ID	Sample Date	Screened Interval (ft bls)	
LETf-MW0005	5/22/2007	22.5 - 27.5	21
	5/14/2009	22.5 - 27.5	13
	12/3/2009	22.5 - 27.5	14
	5/19/2010	22.5 - 27.5	11
	11/3/2010	22.5 - 27.5	5.77
	5/4/2011	22.5 - 27.5	6.2
	11/16/2011	22.5 - 27.5	6.78
	1/9/2013	22.5 - 27.5	9.8
	7/14/2015	22.5 - 27.5	0.71 U
	11/18/2016	22.5 - 27.5	0.71 U
	9/5/2017	22.5 - 27.5	0.71 U
	5/28/2020	22.5 - 27.5	0.41 U
	11/23/2021	22.5 - 27.5	0.71 U
	LETf-MW0007	5/22/2007	33.5 - 38.5
5/14/2009		33.5 - 38.5	59
12/3/2009		33.5 - 38.5	45
5/18/2010		33.5 - 38.5	48
11/3/2010		33.5 - 38.5	56.7
5/4/2011		33.5 - 38.5	57.1
11/16/2011		33.5 - 38.5	60.2
7/24/2012		33.5 - 38.5	60.1
10/10/2012		33.5 - 38.5	50
1/9/2013		33.5 - 38.5	16
11/14/2013		33.5 - 38.5	1.6
7/14/2015		33.5 - 38.5	0.96 I
11/18/2016		33.5 - 38.5	0.71 U
9/6/2017		33.5 - 38.5	2.1
11/26/2019		33.5 - 38.5	0.41 U
5/28/2020		33.5 - 38.5	0.53 I
11/23/2021		33.5 - 38.5	0.71 U

**Table 3-2
Launch Equipment Test Facility - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results**

Category			Volatile Organic Compounds (VOC) by Method 8260
Analyte			VINYL CHLORIDE
FDEP GCTLs (µg/L)			1
FDEP NADCs (µg/L)			100
Location ID	Sample Date	Screened Interval (ft bls)	
LETf-PSB-MW0001I	9/21/2006	22 - 27	92.3
	5/14/2009	22 - 27	79
	12/3/2009	22 - 27	23
	5/19/2010	22 - 27	3.5
	11/3/2010	22 - 27	8.29
	5/4/2011	22 - 27	4.6
	11/16/2011	22 - 27	0.64 I
	1/10/2013	22 - 27	0.36 U
	7/14/2015	22 - 27	0.71 U
	11/18/2016	22 - 27	0.71 U
	5/28/2020	22 - 27	1.2
	11/23/2021	22 - 27	0.71 U
	5/26/2023	22 - 27	0.71 U
LETf-PSB-MW0002I	9/19/2006	22 - 27	26.2
	5/14/2009	22 - 27	6.5
	12/3/2009	22 - 27	3.8
	5/18/2010	22 - 27	0.80 U
	11/3/2010	22 - 27	3.94
	5/4/2011	22 - 27	10.2
	11/16/2011	22 - 27	7.7
	1/9/2013	22 - 27	6.3
	7/14/2015	22 - 27	0.71 U
	11/18/2016	22 - 27	5.4
	9/6/2017	22 - 27	0.94 I
	11/26/2019	22 - 27	0.41 U
	5/28/2020	22 - 27	0.41 U
11/23/2021	22 - 27	0.71 U	

Notes:

FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels,
Chapter 62-777 Florida Administrative Code, Table 1 (2005)

FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code,
Table V (2005)

ft bls = feet below land surface

LETf = Launch Equipment Test Facility

MW = monitoring well

Results and screening criteria presented in µg/L (micrograms per liter)

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

Highlighted cell indicates an exceedance of FDEP NADCs

I = Analyte greater than or equal to the method detection limit, but less than the practical quantitation limit

U = Analyte not detected

The numeric value presented for non-detects is the sample-specific reporting detection limit



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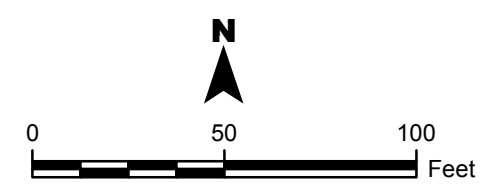
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Legend

-  Intermediate Monitoring Well (Gray Icon - Water Level Only)
-  Building

Notes:

- (20-25) = Monitoring well screen interval in feet below land surface
- Aerial Source: FDOT 2018
- Long Term Monitoring (LTM)
- SWMU = Solid Waste Management Unit







**FIGURE 3-1
 Site Map**

2023 - Industrial Area Long Term Monitoring
 Launch Equipment Test Facility (LETF)
 SWMU 091
 NASA Kennedy Space Center, Florida



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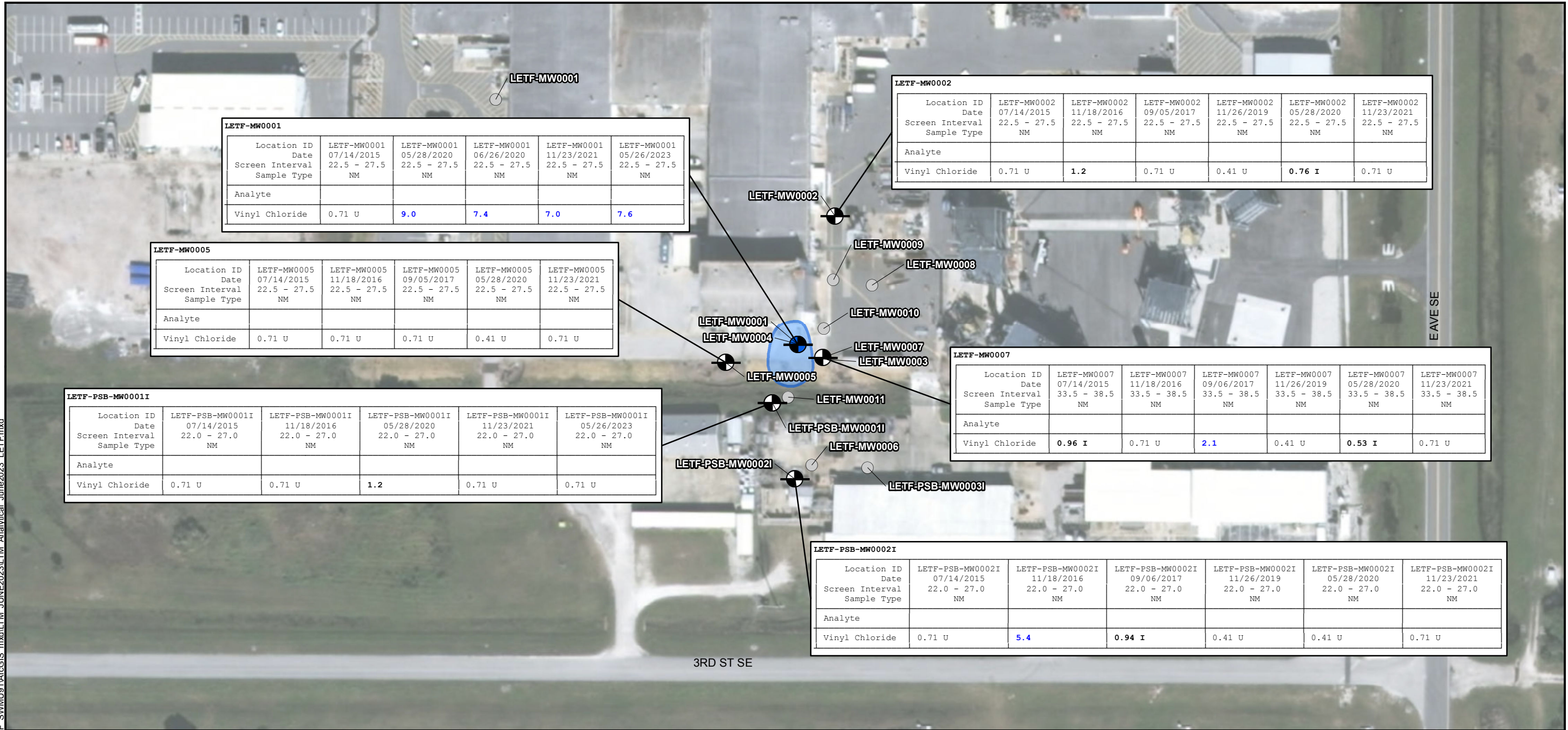
- Legend**
-  Intermediate Monitoring Well (20 - 38.5 ft bls)
 -  Groundwater Contour (NAVD88 feet)
 -  Approximate Direction of Groundwater Flow
 -  (3.53) Groundwater Elevation Contour (NAVD88 feet)

Notes:

- Vertical Datum is NAVD88 (US Feet)
- Monitoring wells were gauged on May 26, 2023
- Groundwater Contour Interval = 0.02 feet
- (20-38.5 ft bls) = Monitoring well screen interval in feet below land surface
- bls = below land surface
- SWMU = Solid Waste Management Unit
- Aerial Source: FDOT 2018
- * = not included in groundwater contouring



FIGURE 3-2
Groundwater Elevation Map - May 2023
 2023 - Industrial Area Long Term Monitoring
 Launch Equipment Test Facility (LETF)
 SWMU 091
 NASA Kennedy Space Center, Florida



LETf-MW0001

Location ID	LETf-MW0001	LETf-MW0001	LETf-MW0001	LETf-MW0001	LETf-MW0001
Date	07/14/2015	05/28/2020	06/26/2020	11/23/2021	05/26/2023
Screen Interval	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5
Sample Type	NM	NM	NM	NM	NM
Analyte					
Vinyl Chloride	0.71 U	9.0	7.4	7.0	7.6

LETf-MW0002

Location ID	LETf-MW0002	LETf-MW0002	LETf-MW0002	LETf-MW0002	LETf-MW0002	LETf-MW0002
Date	07/14/2015	11/18/2016	09/05/2017	11/26/2019	05/28/2020	11/23/2021
Screen Interval	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5
Sample Type	NM	NM	NM	NM	NM	NM
Analyte						
Vinyl Chloride	0.71 U	1.2	0.71 U	0.41 U	0.76 I	0.71 U

LETf-MW0005

Location ID	LETf-MW0005	LETf-MW0005	LETf-MW0005	LETf-MW0005	LETf-MW0005
Date	07/14/2015	11/18/2016	09/05/2017	05/28/2020	11/23/2021
Screen Interval	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5	22.5 - 27.5
Sample Type	NM	NM	NM	NM	NM
Analyte					
Vinyl Chloride	0.71 U	0.71 U	0.71 U	0.41 U	0.71 U

LETf-MW0007

Location ID	LETf-MW0007	LETf-MW0007	LETf-MW0007	LETf-MW0007	LETf-MW0007	LETf-MW0007
Date	07/14/2015	11/18/2016	09/06/2017	11/26/2019	05/28/2020	11/23/2021
Screen Interval	33.5 - 38.5	33.5 - 38.5	33.5 - 38.5	33.5 - 38.5	33.5 - 38.5	33.5 - 38.5
Sample Type	NM	NM	NM	NM	NM	NM
Analyte						
Vinyl Chloride	0.96 I	0.71 U	2.1	0.41 U	0.53 I	0.71 U

LETf-PSB-MW0001I

Location ID	LETf-PSB-MW0001I	LETf-PSB-MW0001I	LETf-PSB-MW0001I	LETf-PSB-MW0001I	LETf-PSB-MW0001I
Date	07/14/2015	11/18/2016	05/28/2020	11/23/2021	05/26/2023
Screen Interval	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0
Sample Type	NM	NM	NM	NM	NM
Analyte					
Vinyl Chloride	0.71 U	0.71 U	1.2	0.71 U	0.71 U

LETf-PSB-MW0002I

Location ID	LETf-PSB-MW0002I	LETf-PSB-MW0002I	LETf-PSB-MW0002I	LETf-PSB-MW0002I	LETf-PSB-MW0002I	LETf-PSB-MW0002I
Date	07/14/2015	11/18/2016	09/06/2017	11/26/2019	05/28/2020	11/23/2021
Screen Interval	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0	22.0 - 27.0
Sample Type	NM	NM	NM	NM	NM	NM
Analyte						
Vinyl Chloride	0.71 U	5.4	0.94 I	0.41 U	0.41 U	0.71 U

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- Legend**
- Intermediate LTM Well, Sample Results Below GCTL
 - Intermediate LTM Well, Sample Results Exceeds GCTL
 - Non-LTM, No Sample Results
 - Approximate Extent of Vinyl Chloride Greater Than GCTLs from Monitoring Well Sampling

- Notes:**
- LTM = Long Term Monitoring
 - MW = Monitoring Well
 - NM = Normal Sample
 - SWMU = Solid Waste Management Unit
 - All results and screening criteria presented in µg/L.
 - I = Result is greater than or equal to the Method Detection Limit (MDL) but less than the Practical Quantitation Limit (PQL).
 - U = Result was below the laboratory MDL.
 - FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777, F.A.C.
 - Bolded** results indicate the presence of an analyte at the specified concentration.
 - Blue** font indicates an exceedance of FDEP GCTLs.
 - Aerial Source: ESRI 2018.
 - Depth of monitoring well screen interval is presented in feet below land surface.

Analyte	GCTL
VINYL CHLORIDE	1



FIGURE 3-3
Groundwater Sampling Analytical Results

2023 - Industrial Area Long Term Monitoring
Launch Equipment Test Facility (LETf)
SWMU 091
NASA Kennedy Space Center, Florida

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4. GENERAL SERVICES ADMINISTRATION SEIZED PROPERTY

This section provides a summary of the GSSP site (SWMU 095). Refer to **Figure 4-1** for a site map.

4.1 SITE DESCRIPTION AND HISTORY

The GSSP is located on the western edge of the KSC industrial area on the north side of the Kennedy Parkway North and 5th Street Southeast/Odyssey Way intersection. The site was developed in 1989 for storage and auctioning of vehicles, trucks, and boats seized by various government agencies. Minor vehicle maintenance was also performed at the site. Major vehicle repairs were handled off-site and outside of KSC property. Vehicle detailing activities were also performed at the GSA Vehicle Maintenance Facility. The site is currently an open field, and the impacts from these historical activities extend from west of the KSC Child Care Facility toward the borrow pond located west of Kennedy Parkway (Geosyntec 2012).

An RFI (Geosyntec 2007) and RFI Addendum (Geosyntec 2010) were completed in 2007 through 2010 to assess groundwater contaminants at GSSP, including tetrachloroethene (PCE) and its degradation products. GCTL exceedances were found across the site at various depths between 4 ft bls and 50 ft bls. A PCE source area was found near the center of the site, and a Source Area IM was performed in 2008. The IM included open soil excavation to a depth of 12.5 ft bls that was aerated and then backfilled with a hydrogen releasing compound (Geosyntec 2012).

Between 2010 and 2011, another IM was performed downgradient of the PCE source area utilizing enhanced reductive dechlorination (ERD) to reduce volatile organic compounds (VOC) concentrations to below NADCs within the treatment zone. Six drums containing emulsified oil plus 500 liters of microbial culture were injected at 46 locations throughout the treatment zone where TCE concentrations exceeded the NADC. A solar powered recirculation system aided in the distribution of amendments (Geosyntec 2012). Once the ERD IM and performance monitoring sampling was completed at GSSP, annual interim groundwater monitoring was approved. The site was added to the IA LTM Program in 2012 and annual sampling has continued through the present with an expanded sampling event every five years to include additional monitoring wells and the analysis of MNA parameters at select monitoring wells.

Naphthalene concentrations were detected above the GCTL at monitoring well GSSP-MW0024 in 2018. Monitoring well GSSP-MW0025 was found destroyed during the 2018 sampling event; therefore, it was abandoned along with adjacent monitoring well GSSP-MW0024 (Jacobs-CORE 2019a). Monitoring well GSSP-MW0024 was re-installed in April 2019 to continue COC analysis (Jacobs-CORE 2019b).

Natural dechlorination of VOCs has been successful during the LTM at GSSP. The current COC list was decreased to only VC and naphthalene in 2023 since the other select VOC concentrations were below GCTLs since 2018.

4.2 FIELD ACTIVITIES

Field activities were performed at GSSP in November 2023. Groundwater samples were collected from 14 monitoring wells and groundwater levels were measured at 33 monitoring wells. The following table shows the network of monitoring wells used for groundwater level measurements and sampling at GSSP.

Well ID	Screen Interval (ft bls)	Analysis
GSSP-MW0006	5-15	WL
GSSP-MW0007	25-35	WL
GSSP-MW0008	5-15	WL
GSSP-MW0009	25-35	WL
GSSP-MW0013	5-15	WL + VC
GSSP-MW0014	25-35	WL
GSSP-MW0019	15-25	WL + VC
GSSP-MW0020	25-35	WL + VC
GSSP-MW0021	40-50	WL
GSSP-MW0022	15-25	WL
GSSP-MW0023	25-35	WL
GSSP-MW0024R	15-25	WL + VC and Naphthalene
GSSP-MW0026	5-15	WL
GSSP-MW0027	5-15	WL
GSSP-MW0034	5-15	WL + VC
GSSP-MW0035	15-25	WL + VC and Naphthalene
GSSP-MW0036	30-40	WL + VC
GSSP-MW0039	25-35	WL
GSSP-MW0042	30-40	WL
GSSP-MW0043R	5-15	WL
GSSP-MW0044R	25-35	WL + VC
GSSP-MW0045	15-25	WL
GSSP-MW0047	15-25	WL
GSSP-MW0049	55-60	WL
GSSP-MW0053	15-25	WL + VC and Naphthalene
GSSP-MW0054	25-35	WL
GSSP-MW0055	5-15	WL
GSSP-MW0058	10-15	WL
GSSP-MW0059	16-21	WL + VC
GSSP-MW0060	10-15	WL + VC
GSSP-MW0061	16-21	WL + VC
GSSP-MW0062	10-15	WL + VC
GSSP-MW0063	16-21	WL + VC

ID = identification

MW = monitoring well

Naphthalene = naphthalene analysis by Method 8270

VC = vinyl chloride analysis by Method 8260

WL = water level measurement

Groundwater samples collected during the 2023 annual sampling event were analyzed, as prescribed in the table above, for one or both of the following: VC by Method 8260 and naphthalene by Method 8270. The following table shows the COCs for GSSP with their respective GCTL and NADC.

COC	GCTL (µg/L)	NADC (µg/L)
VC	1	100
Naphthalene	14	140

4.3 WATER LEVEL COLLECTION AND GROUNDWATER FLOW DIRECTION

Groundwater levels collected during the 2023 annual sampling event were used to calculate groundwater elevations presented in **Table 4-1**. Groundwater elevations collected during this event were used to determine the contours and flow direction for the shallow (2.5 ft bls to 15 ft bls), shallow-intermediate (15 ft bls to 25 ft bls), and intermediate aquifer zones (25 ft bls to 40 ft bls), shown on **Figure 4-2** through **Figure 4-4**. The groundwater flow direction for the shallow and shallow-intermediate aquifer zones was toward the northwest, while the groundwater flow direction in the intermediate aquifer zone was toward the west-northwest. The groundwater flow directions during the 2023 sampling event were consistent with the historical flow directions at GSSP.

4.4 ANALYTICAL RESULTS

Groundwater samples from 14 monitoring wells were collected during the November 2023 LTM event. A summary of the analytical results is presented in **Table 4-2**. Analytical results are depicted on **Figure 4-5**

Analytical results for each COC present at GSSP are discussed below:

- Vinyl chloride

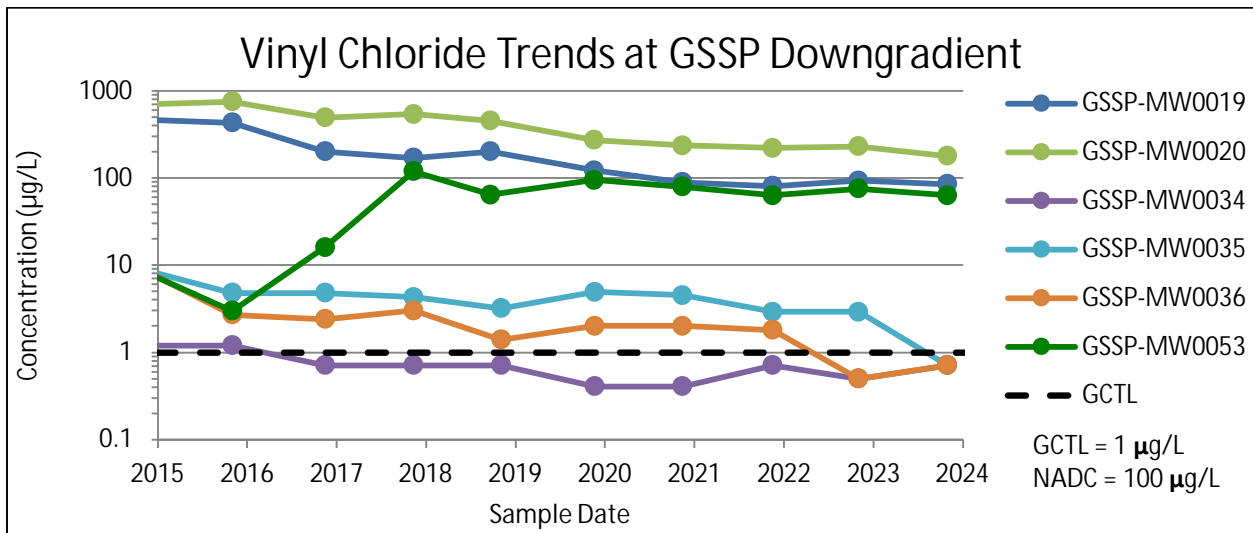
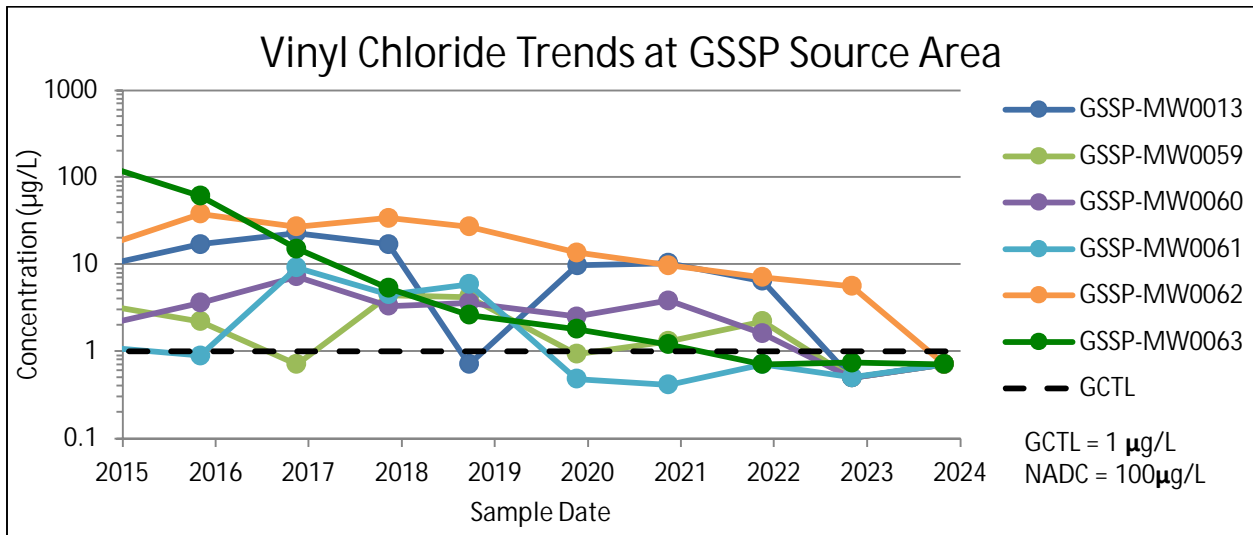
In November 2023, VC was detected at concentrations above the GCTL in monitoring wells GSSP-MW0019 (85 µg/L) and GSSP-MW0053 (63 µg/L). The VC concentration in monitoring well GSSP-MW0020 (180 µg/L) exceeded both the GCTL and the NADC.

- Naphthalene

In November 2023, naphthalene was detected at a concentration above the GCTL in monitoring well GSSP-MW0024R (39 µg/L).

4.5 TREND ANALYSIS

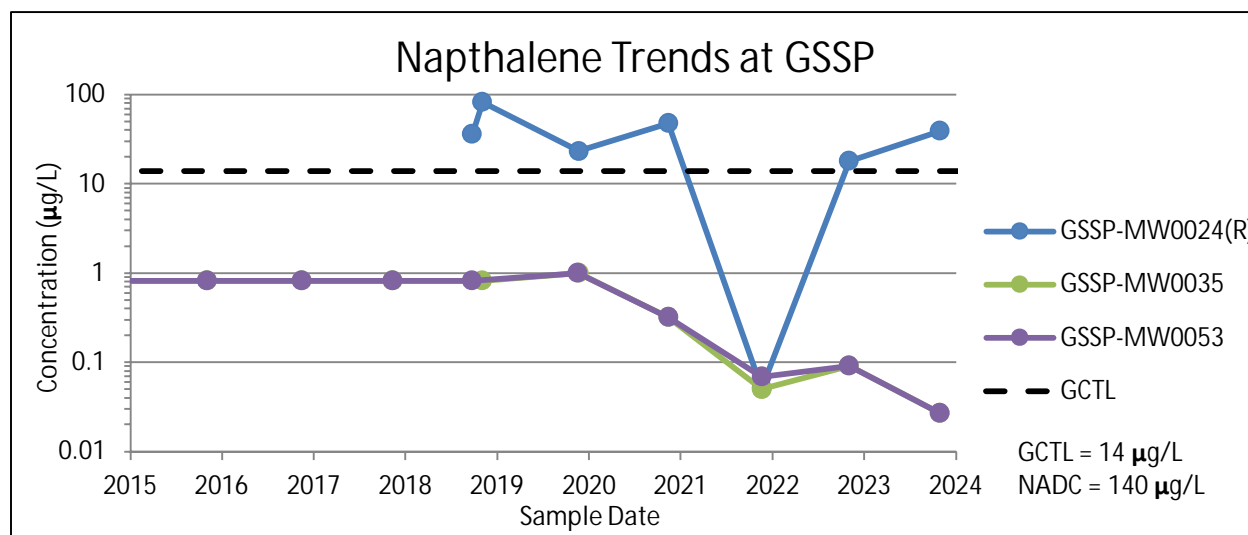
VC concentrations at GSSP show an overall decreasing trend. The three monitoring wells that currently exceed the GCTL had a decrease in VC concentration between 2022 and 2023: GSSP-MW0019 (93 µg/L to 85 µg/L), GSSP-MW0020 (230 µg/L to 180 µg/L), and GSSP-MW0053 (75 µg/L to 63 µg/L). Two monitoring wells (GSSP-MW0035 and GSSP-MW0062) that exceeded the GCTL in 2022 decreased to below the GCTL in 2023. The following trend charts present the current and historical VC concentrations since 2015 at former source area and downgradient wells.



A Mann-Kendall trend analysis was performed for VC at GSSP, and the results are summarized in the following table. Sampling results, from the past 10 years of data, show that VC concentrations are decreasing or have no significant trend at each sampled monitoring well.

Mann-Kendall Statistics Summary VC at GSSP			
Monitoring Well	Concentration Trend	Monitoring Well	Concentration Trend
GSSP-MW0013	Decreasing	GSSP-MW0044R	Decreasing
GSSP-MW0019	Decreasing	GSSP-MW0053	No Trend
GSSP-MW0020	Decreasing	GSSP-MW0059	Probably Decreasing
GSSP-MW0024R	No Trend	GSSP-MW0060	Probably Decreasing
GSSP-MW0034	Probably Decreasing	GSSP-MW0061	Probably Decreasing
GSSP-MW0035	Decreasing	GSSP-MW0062	Decreasing
GSSP-MW0036	Decreasing	GSSP-MW0063	Decreasing

Naphthalene concentrations present at monitoring well GSSP-MW0024(R) (added parentheses referring to both the original well and the replacement well) have fluctuated over the past six years but are statistically stable. No significant concentrations of naphthalene have been detected in monitoring wells upgradient or downgradient of monitoring well GSSP-MW0024(R). The following trend chart and Mann-Kendall analysis summarizes the naphthalene concentrations at monitoring well GSSP-MW0024(R) and select upgradient and downgradient wells.



Mann-Kendall Statistics Summary Naphthalene at GSSP			
Monitoring Well	Concentration Trend	Monitoring Well	Concentration Trend
GSSP-MW0024(R)	Stable	GSSP-MW0053	Decreasing
GSSP-MW0035	Decreasing		

4.6 CONCLUSION AND RECOMMENDATION

VC concentrations exceeded the GCTL at three monitoring wells and the NADC at one monitoring well (GSSP-MW0020) in November 2023; however, concentrations of VC continue to show an overall decreasing trend. Naphthalene concentrations remain stable and above the GCTL at GSSP-MW0024R with no detections in monitoring wells upgradient or downgradient.

The list of monitoring wells in which MNA parameters are sampled during the expanded sampling events is recommended to be adjusted to focus on the monitoring wells with current VC exceedances to evaluate reductive dechlorination conditions within the plume area. Monitoring wells GSSP-MW0019, GSSP-MW0020, and GSSP-MW0053 are recommended to include methane, ethane, and ethene; Dehalococoides; and total organic carbon analyses during the five-year expanded sampling events.

Based on a review of historical data following the February 2024 KSCRT meeting, monitoring wells GSSP-MW0050 (5-15 ft bls), GSSP-MW0051 (15-25 ft bls), and GSSP-MW0052 (25-35 ft bls) were found to be located upgradient of monitoring wells GSSP-MW0019 and GSSP-MW0020 and were last sampled in 2009, during the RFI. VC concentrations were reported equal to the GCTL at monitoring well GSSP-MW0050 and exceeding the NADC at monitoring wells GSSP-MW0051 and GSSP-MW0052; however, these three monitoring wells were not included in the original LTM plan. VC concentrations have reduced to below the GCTL around the source area; therefore, these monitoring wells are recommended to be added to the LTM Program with annual water level measurements and VC analysis during the expanded sampling events to serve as an additional upgradient point of compliance.

Monitoring wells GSSP-MW0028 (5-15 ft bls) and GSSP-MW0054 (25-35 ft bls) are located downgradient of monitoring wells GSSP-MW0019 and GSSP-MW0020 and are recommended to be added to the expanded sampling events for VC analysis. Monitoring well GSSP-MW0028 is also recommended to be added to the list of annual groundwater level measurements. Monitoring well GSSP-MW0028 had a VC exceedance of 2.0 µg/L the last time it was sampled in 2009. Monitoring well GSSP-MW0054 had three non-detectable VC analyses before being removed from the sampling program in 2016; however, this location has the same screen interval depth as upgradient monitoring well GSSP-MW0020, and the VC concentration is recommended to be analyzed again to confirm the downgradient VC concentration in the intermediate aquifer zone.

The annual LTM sampling frequency is recommended to continue with an expanded sampling event every five years. The next sampling event, scheduled for November 2024, will be the five-year expanded sampling event and will include water level measurements at 37 monitoring wells and groundwater samples from 28 monitoring wells.

The following table shows the recommended monitoring wells for water level collection and groundwater sampling for the next sampling event at GSSP scheduled for November 2024.

Well ID	Screen Interval (ft bls)	Analysis
GSSP-MW0006	5-15	WL
GSSP-MW0007	25-35	WL
GSSP-MW0008	5-15	WL
GSSP-MW0009	25-35	WL
GSSP-MW0013	5-15	WL + VC
GSSP-MW0014	25-35	WL + VC
GSSP-MW0019	15-25	WL + VC, MEE, Dhc, and TOC
GSSP-MW0020	25-35	WL + VC, MEE, Dhc, and TOC
GSSP-MW0021	40-50	WL + VC
GSSP-MW0022	15-25	WL + VC
GSSP-MW0023	25-35	WL + VC
GSSP-MW0024R	15-25	WL + VC and Naph
GSSP-MW0026	5-15	WL + VC
GSSP-MW0027	5-15	WL + VC
GSSP-MW0028	5-15	WL + VC
GSSP-MW0034	5-15	WL + VC
GSSP-MW0035	15-25	WL + VC and Naph
GSSP-MW0036	30-40	WL + VC
GSSP-MW0039	25-35	WL + VC
GSSP-MW0042	30-40	WL + VC
GSSP-MW0043R	5-15	WL + VC
GSSP-MW0044R	25-35	WL + VC
GSSP-MW0045	15-25	WL
GSSP-MW0047	15-25	WL
GSSP-MW0049	55-60	WL
GSSP-MW0050	5-15	WL + VC
GSSP-MW0051	15-25	WL + VC
GSSP-MW0052	25-35	WL + VC
GSSP-MW0053	15-25	WL + VC, Naph, MEE, Dhc, and TOC
GSSP-MW0054	25-35	WL + VC
GSSP-MW0055	5-15	WL
GSSP-MW0058	10-15	WL
GSSP-MW0059	16-21	WL + VC
GSSP-MW0060	10-15	WL + VC
GSSP-MW0061	16-21	WL + VC
GSSP-MW0062	10-15	WL + VC
GSSP-MW0063	16-21	WL + VC

Dhc = Dehalococcoides analysis
ID = identification
MEE = methane, ethane, and ethene analysis by Method RSK 175
MW = monitoring well
Naph = naphthalene analysis by Method 8270
TOC = total organic carbon by Method SM5310
VC = vinyl chloride analysis by Method 8260
WL = water level measurement

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Table 4-1
General Services Administration Seized Property - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

SHALLOW WELL ID:	GSSP-MW0006		GSSP-MW0008		GSSP-MW0013	
Screen Interval (ft bls):	5 - 15		5 - 15		5 - 15	
TOC Elevation (ft NAVD88):	7.93		6.29		5.60	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	5.72	2.21	2.18	4.11	3.41	2.19
November 2014	4.56	3.37	2.36	3.93	2.26	3.34
November 2015	5.42	2.51	2.89	3.40	3.08	2.52
November 2016	4.67	3.26	2.64	3.65	2.33	3.27
November 2017	3.88	4.05	1.97	4.32	1.50	4.10
September 2018	7.38	0.55	3.85	2.44	3.84	1.76
November 2019	3.87	4.06	1.58	4.71	1.48	4.12
November 2020	3.81	4.12	1.49	4.80	1.46	4.14
November 2021	3.29	4.64	0.65	5.64	0.83	4.77
November 2022	4.57	3.36	2.46	3.83	2.22	3.38
November 2023	5.33	2.60	2.86	3.43	2.99	2.61

SHALLOW WELL ID:	GSSP-MW0026		GSSP-MW0027		GSSP-MW0034	
Screen Interval (ft bls):	5 - 15		5 - 15		5 - 15	
TOC Elevation (ft NAVD88):	5.88		5.60		7.30	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	3.98	1.90	3.89	1.71	7.18	0.12
November 2014	2.85	3.03	2.68	2.92	5.89	1.41
November 2015	3.67	2.21	3.29	2.31	6.78	0.52
November 2016	2.90	2.98	2.81	2.79	5.84	1.46
November 2017	2.10	3.78	1.98	3.62	4.68	2.62
September 2018	3.51	2.37	3.07	2.53	Not Measured	
November 2019	2.08	3.80	1.89	3.71	4.94	2.36
November 2020	2.13	3.75	2.02	3.58	4.69	2.61
November 2021	1.55	4.33	1.59	4.01	4.18	3.12
November 2022	2.80	3.08	2.59	3.01	5.28	2.02
November 2023	3.53	2.35	3.29	2.31	6.38	0.92

SHALLOW WELL ID:	GSSP-MW0043R		GSSP-MW0055		GSSP-MW0058	
Screen Interval (ft bls):	5 - 15		5 - 15		10 - 15	
TOC Elevation (ft NAVD88):	7.54		5.39		7.19	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	5.02	2.52	3.38	2.01	4.85	2.34
November 2014	3.94	3.60	2.64	2.75	3.75	3.44
November 2015	4.72	2.82	3.13	2.26	4.57	2.62
November 2016	4.07	3.47	2.68	2.71	3.85	3.34
November 2017	3.36	4.18	2.33	3.06	3.06	4.13
September 2018	4.70	2.84	3.12	2.27	4.53	2.66
November 2019	3.12	4.42	2.38	3.01	2.97	4.22
November 2020	3.00	4.54	2.58	2.81	2.91	4.28
November 2021	2.18	5.36	2.21	3.18	2.28	4.91
November 2022	3.83	3.71	2.73	2.66	3.68	3.51
November 2023	4.60	2.94	3.03	2.36	4.45	2.74

SHALLOW WELL ID:	GSSP-MW0060		GSSP-MW0062	
Screen Interval (ft bls):	10 - 15		10 - 15	
TOC Elevation (ft NAVD88):	7.59		6.50	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	5.49	2.10	4.19	2.31
November 2014	4.18	3.41	3.06	3.44
November 2015	4.99	2.60	3.91	2.59
November 2016	4.25	3.34	3.17	3.33
November 2017	3.46	4.13	2.35	4.15
September 2018	4.65	2.94	3.94	2.56
November 2019	3.42	4.17	2.30	4.20
November 2020	3.37	4.22	2.27	4.23
November 2021	2.70	4.89	1.65	4.85
November 2022	4.15	3.44	2.99	3.51
November 2023	4.92	2.67	3.82	2.68

SHALLOW - INTERMEDIATE WELL ID:	GSSP-MW0019		GSSP-MW0022		GSSP-MW0024	
Screen Interval (ft bls):	15 - 25		15 - 25		15 - 25	
TOC Elevation (ft NAVD88):	6.30		4.97		7.37	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	4.34	1.96	3.05	1.92	Not Measured	
November 2014	3.25	3.05	2.02	2.95	Not Measured	
November 2015	4.04	2.26	2.81	2.16	Not Measured	
November 2016	3.35	2.95	2.09	2.88	Not Measured	
November 2017	2.48	3.82	1.08	3.89	Not Measured	
September 2018	3.89	2.41	3.90	1.07	3.07	4.30
November 2019	2.50	3.80	1.20	3.77	Abandoned	
November 2020	2.51	3.79	1.15	3.82	--	
November 2021	1.88	4.42	0.44	4.53	--	
November 2022	3.20	3.10	1.89	3.08	--	
November 2023	3.95	2.35	2.64	2.33	--	

Table 4-1
General Services Administration Seized Property - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

SHALLOW - INTERMEDIATE WELL ID:	GSSP-MW0024R		GSSP-MW0035		GSSP-MW0045	
Screen Interval (ft bls):	15 - 25		15 - 25		15 - 25	
TOC Elevation (ft NAVD88):	4.32		7.19		7.91	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	Not Installed		7.03	0.16	5.72	2.19
November 2014	--		5.78	1.41	4.55	3.36
November 2015	--		6.65	0.54	5.38	2.53
November 2016	--		5.59	1.60	4.68	3.23
November 2017	--		4.58	2.61	3.88	4.03
September 2018	--		Not Measured		7.41	0.50
November 2019	0.97	3.35	4.88	2.31	3.85	4.06
November 2020	0.90	3.42	4.60	2.59	3.82	4.09
November 2021	0.27	4.05	4.10	3.09	3.28	4.63
November 2022	1.55	2.77	5.23	1.96	4.57	3.34
November 2023	2.41	1.91	6.30	0.89	5.35	2.56

SHALLOW - INTERMEDIATE WELL ID:	GSSP-MW0047		GSSP-MW0053		GSSP-MW0059	
Screen Interval (ft bls):	15 - 25		15 - 25		16 - 21	
TOC Elevation (ft NAVD88):	6.29		6.17		7.34	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	3.90	2.39	4.26	1.91	5.04	2.30
November 2014	2.75	3.54	3.21	2.96	3.93	3.41
November 2015	3.54	2.75	3.98	2.19	4.47	2.87
November 2016	2.86	3.43	3.30	2.87	3.98	3.36
November 2017	2.13	4.16	2.39	3.78	3.18	4.16
September 2018	3.58	2.71	3.82	2.35	4.70	2.64
November 2019	2.03	4.26	2.43	3.74	3.13	4.21
November 2020	2.00	4.29	2.45	3.72	3.10	4.24
November 2021	1.47	4.82	1.83	4.34	2.45	4.89
November 2022	2.75	3.54	3.12	3.05	3.88	3.46
November 2023	3.50	2.79	3.88	2.29	4.86	2.48

SHALLOW - INTERMEDIATE WELL ID:	GSSP-MW0061		GSSP-MW0063	
Screen Interval (ft bls):	16 - 21		16 - 21	
TOC Elevation (ft NAVD88):	7.76		6.57	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	5.31	2.45	4.24	2.33
November 2014	4.32	3.44	3.14	3.43
November 2015	5.12	2.64	3.95	2.62
November 2016	4.42	3.34	3.24	3.33
November 2017	3.60	4.16	2.43	4.14
September 2018	4.65	3.11	3.94	2.63
November 2019	3.54	4.22	2.35	4.22
November 2020	3.53	4.23	2.34	4.23
November 2021	2.89	4.87	1.74	4.83
November 2022	4.30	3.46	3.08	3.49
November 2023	5.08	2.68	3.83	2.74

INTERMEDIATE WELL ID:	GSSP-MW0007		GSSP-MW0009		GSSP-MW0014	
Screen Interval (ft bls):	25 - 35		25 - 35		25 - 35	
TOC Elevation (ft NAVD88):	7.90		6.30		5.38	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	5.67	2.23	3.89	2.41	Not Measured	
November 2014	4.53	3.37	2.74	3.56	2.14	3.24
November 2015	5.35	2.55	3.50	2.80	2.94	2.44
November 2016	4.67	3.23	2.89	3.41	2.28	3.10
November 2017	3.83	4.07	2.16	4.14	1.36	4.02
September 2018	7.36	0.54	3.59	2.71	3.84	1.54
November 2019	3.80	4.10	2.03	4.27	1.33	4.05
November 2020	3.78	4.12	1.99	4.31	1.33	4.05
November 2021	3.24	4.66	1.47	4.83	0.69	4.69
November 2022	4.52	3.38	2.71	3.59	2.05	3.33
November 2023	5.30	2.60	3.53	2.77	2.87	2.51

INTERMEDIATE WELL ID:	GSSP-MW0020		GSSP-MW0023		GSSP-MW0036	
Screen Interval (ft bls):	25 - 35		25 - 35		30 - 40	
TOC Elevation (ft NAVD88):	6.30		4.82		7.15	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	4.38	1.92	2.95	1.87	7.09	0.06
November 2014	3.29	3.01	1.93	2.89	5.83	1.32
November 2015	4.09	2.21	2.67	2.15	6.90	0.25
November 2016	3.37	2.93	1.93	2.89	5.68	1.47
November 2017	2.51	3.79	1.02	3.80	4.68	2.47
September 2018	3.94	2.36	3.75	1.07	Not Measured	
November 2019	2.55	3.75	1.10	3.72	4.97	2.18
November 2020	2.54	3.76	1.12	3.70	4.65	2.50
November 2021	1.91	4.39	0.44	4.38	4.23	2.92
November 2022	3.23	3.07	1.78	3.04	5.29	1.86
November 2023	4.00	2.30	2.58	2.24	6.35	0.80

Table 4-1
General Services Administration Seized Property - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

INTERMEDIATE WELL ID:	GSSP-MW0039		GSSP-MW0042		GSSP-MW0044R	
Screen Interval (ft bls):	25 - 35		30 - 40		25 - 35	
TOC Elevation (ft NAVD88):	7.82		6.17		7.15	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	7.64	0.18	6.45	-0.28	4.92	2.23
November 2014	6.41	1.41	5.23	0.94	3.94	3.21
November 2015	7.28	0.54	6.08	0.09	4.74	2.41
November 2016	6.24	1.58	5.15	1.02	4.08	3.07
November 2017	5.20	2.62	4.14	2.03	3.21	3.94
September 2018	3.70	4.12	5.96	0.21	4.70	2.45
November 2019	5.50	2.32	4.38	1.79	3.15	4.00
November 2020	5.22	2.60	4.04	2.13	3.10	4.05
November 2021	4.74	3.08	3.76	2.41	2.44	4.71
November 2022	5.84	1.98	4.64	1.53	3.90	3.25
November 2023	6.90	0.92	5.78	0.39	4.67	2.48

INTERMEDIATE WELL ID:	GSSP-MW0054	
Screen Interval (ft bls):	25 - 35	
TOC Elevation (ft NAVD88):	6.10	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	4.17	1.93
November 2014	3.12	2.98
November 2015	3.92	2.18
November 2016	3.20	2.90
November 2017	2.33	3.77
September 2018	3.73	2.37
November 2019	2.38	3.72
November 2020	2.39	3.71
November 2021	1.78	4.32
November 2022	3.09	3.01
November 2023	3.81	2.29

DEEP WELL ID:	GSSP-MW0021		GSSP-MW0049	
Screen Interval (ft bls):	40 - 50		55 - 60	
TOC Elevation (ft NAVD88):	6.07		7.49	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2013	4.26	1.81	5.01	2.48
November 2014	3.14	2.93	3.91	3.58
November 2015	3.92	2.15	4.74	2.75
November 2016	3.14	2.93	4.02	3.47
November 2017	2.26	3.81	3.23	4.26
September 2018	3.76	2.31	4.64	2.85
November 2019	2.27	3.80	3.11	4.38
November 2020	2.21	3.86	3.04	4.45
November 2021	1.60	4.47	2.42	5.07
November 2022	2.92	3.15	3.82	3.67
November 2023	3.74	2.33	4.60	2.89

Notes:

bls = below land surface

BTOC = below top of casing

ft = feet

GSSP = General Services Administration Seized Property

MW = monitoring well

NAVD88 = North American Vertical Datum of 1988

TOC = top of casing

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Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM		Volatile Organic Compounds (VOC) by Method 8260				
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0013	6/4/2007	5 - 15	NA	NA	5.0 U	5.6	6.6	64.9	105
	6/3/2008	5 - 15	NA	NA	20 U	20 U	20 U	55	360
	7/1/2009	5 - 15	NA	NA	1.0 U	1.3	6.3	14.7	490
	10/26/2010	5 - 15	NA	NA	0.25 U	0.26 U	12.1	55.6	645
	9/21/2011	5 - 15	NA	NA	0.25 U	0.49 I	10.6	2.2	36.7
	11/1/2012	5 - 15	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.90 I
	11/6/2013	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	28
	11/11/2014	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	10
	11/4/2015	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.65 I	17
	11/15/2016	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	1.3	23
	11/13/2017	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	1.4	17
	9/25/2018	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	5 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.53 I	9.7
	11/17/2020	5 - 15	NA	NA	0.22 U	0.35 U	0.22 U	0.54 I	10.3
11/22/2021	5 - 15	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	6.4	
11/8/2022	5 - 15	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
11/6/2023	5 - 15	NA	NA	NA	NA	NA	NA	0.71 U	
GSSP-MW0014	6/4/2007	25 - 35	NA	NA	1.0 U	1.0 U	1.0	1.0 U	572
	7/1/2009	25 - 35	NA	NA	5.0 U	50	13	210	1,700
	10/26/2010	25 - 35	NA	NA	1.3 U	25	9.3	245	1,180
	9/21/2011	25 - 35	NA	NA	0.25 U	4.9	15.8	388	699
	11/1/2012	25 - 35	NA	NA	0.22 U	0.36 U	0.24 I	0.36 U	25
	11/11/2014	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.87 I
	11/4/2015	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.97 I
	11/17/2016	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	25 - 35	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0019	6/5/2007	15 - 25	NA	NA	1.0 U	1.0 U	5.0	25.5	586
	7/1/2009	15 - 25	NA	NA	1.0 U	4.4	15.8	44.2	1,000
	10/26/2010	15 - 25	NA	NA	1.3 U	1.3 U	11.6	10.1	957
	9/22/2011	15 - 25	NA	NA	0.25 U	0.63 I	17.1	38	1,210
	10/31/2012	15 - 25	NA	NA	0.22 U	0.36 U	16	25	1,500
	11/4/2013	15 - 25	NA	0.82 U	0.76 U	0.89 U	16	21	740
	11/12/2014	15 - 25	NA	8.2 U	7.6 U	8.9 U	7.3 U	5.3 U	470
	11/3/2015	15 - 25	NA	0.82 U	0.76 U	0.89 U	4.7	1.4	430
	11/17/2016	15 - 25	NA	1.6 U	1.5 U	1.8 U	2.1	1.4 I	200
	11/13/2017	15 - 25	NA	1.6 U	1.5 U	1.8 U	2.4	1.6 I	170
	9/25/2018	15 - 25	NA	1.6 U	1.5 U	1.8 U	2.3	8.3	200
	11/22/2019	15 - 25	NA	1.0 U	0.22 U	0.35 U	1.6	1.4	122
	11/17/2020	15 - 25	NA	NA	0.22 U	0.35 U	1.1	2.2	89.4
	11/22/2021	15 - 25	NA	NA	0.76 U	0.89 U	1.0	2.5	81
11/8/2022	15 - 25	NA	NA	0.50 U	0.50 U	0.74 I	0.78 I	93	
11/6/2023	15 - 25	NA	NA	NA	NA	NA	NA	85	

Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM		Volatile Organic Compounds (VOC) by Method 8260				
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0020	6/5/2007	25 - 35	NA	NA	1.0 U	1.0 U	7.9	41.2	718
	7/1/2009	25 - 35	NA	NA	1.0 U	1.0 U	8.1	5.3	990
	10/26/2010	25 - 35	NA	NA	1.3 U	1.3 U	7.7	1.3 U	896
	9/22/2011	25 - 35	NA	NA	0.25 U	0.26 U	13.5	0.59 I	1,490
	10/31/2012	25 - 35	NA	NA	0.22 U	0.36 U	11	0.45 I	1,200
	11/4/2013	25 - 35	NA	0.82 U	0.76 U	0.89 U	14	0.53 U	1,100
	11/12/2014	25 - 35	NA	8.2 U	7.6 U	8.9 U	7.3 U	5.3 U	700
	11/3/2015	25 - 35	NA	4.1 U	3.8 U	4.4 U	7.6	2.6 U	750
	11/17/2016	25 - 35	NA	4.1 U	3.8 U	4.4 U	5.6	2.6 U	490
	11/13/2017	25 - 35	NA	8.2 U	7.6 U	8.9 U	7.3 U	5.3 U	540
	9/25/2018	25 - 35	NA	4.1 U	3.8 U	4.4 U	3.6 I	5.0	450
	11/22/2019	25 - 35	NA	1.0 U	0.22 U	0.35 U	2.7	0.28 U	271
	11/17/2020	25 - 35	NA	NA	0.22 U	0.35 U	2.6	0.28 U	235
	11/22/2021	25 - 35	NA	NA	0.76 U	0.89 U	2.4	0.53 U	220
11/8/2022	25 - 35	NA	NA	0.50 U	0.50 U	1.5	0.50 U	230	
11/6/2023	25 - 35	NA	NA	NA	NA	NA	NA	180	
GSSP-MW0021	6/5/2007	40 - 50	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	7/1/2009	40 - 50	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.4
	10/26/2010	40 - 50	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.22 U
	9/22/2011	40 - 50	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.77 I
	10/31/2012	40 - 50	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.36 U
	11/5/2013	40 - 50	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/22/2019	40 - 50	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.43 I
GSSP-MW0022	6/5/2007	15 - 25	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/30/2009	15 - 25	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	10/26/2010	15 - 25	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.22 U
	9/22/2011	15 - 25	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.22 U
	10/31/2012	15 - 25	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.36 U
	11/5/2013	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/12/2014	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	15 - 25	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0023	6/5/2007	25 - 35	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	6/30/2009	25 - 35	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	10/26/2010	25 - 35	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.22 U
	9/22/2011	25 - 35	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.22 U
	10/31/2012	25 - 35	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.36 U
	11/5/2013	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	25 - 35	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0024	6/5/2007	15 - 25	NA	NA	1.0 U	1.0 U	1.0 U	0.59 I	5.5
	7/1/2009	15 - 25	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	2.3
	9/26/2018	15 - 25	NA	36.0	0.76 U	0.89 U	1.5	0.53 U	0.71 U
	11/7/2018	15 - 25	NA	82.0	0.76 U	0.89 U	1.3	0.53 U	0.71 U

Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM		Volatile Organic Compounds (VOC) by Method 8260				
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0024R	11/25/2019	15 - 25	9.2	23.2	0.22 U	0.35 U	0.66 I	0.28 U	0.41 U
	11/17/2020	15 - 25	47.6	NA	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
	11/22/2021	15 - 25	0.051 I	NA	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/8/2022	15 - 25	18	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
	11/6/2023	15 - 25	39	NA	NA	NA	NA	NA	0.71 U
GSSP-MW0026	9/25/2007	5 - 15	NA	NA	0.25 U	0.38 U	0.20 U	0.28 U	0.34 U
	7/1/2009	5 - 15	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/1/2012	5 - 15	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.36 U
	11/5/2013	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/12/2014	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	5 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0027	9/25/2007	5 - 15	NA	NA	1.3 U	1.9 U	1.0 U	1.4 U	150
	7/1/2009	5 - 15	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	10/25/2010	5 - 15	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	1.2
	9/22/2011	5 - 15	NA	NA	0.25 U	0.26 U	1.9	0.31 I	189
	11/1/2012	5 - 15	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.45 I
	11/4/2013	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/10/2014	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	5 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0028	9/25/2007	5 - 15	NA	NA	0.25 U	0.38 U	0.2 U	0.28 U	0.34 U
	7/1/2009	5 - 15	NA	NA	1 U	1 U	1 U	1 U	2.0
GSSP-MW0034	9/24/2007	5 - 15	NA	NA	0.25 U	0.38 U	0.20 U	0.28 U	0.34 U
	7/1/2009	5 - 15	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	4.7
	10/25/2010	5 - 15	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	4.8
	9/22/2011	5 - 15	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	5.0
	11/1/2012	5 - 15	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	3.9
	11/6/2013	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.7
	11/12/2014	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	1.2
	11/4/2015	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	1.2
	11/17/2016	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/13/2017	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/7/2018	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	5 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
	11/17/2020	5 - 15	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
	11/22/2021	5 - 15	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/8/2022	5 - 15	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
11/6/2023	5 - 15	NA	NA	NA	NA	NA	NA	0.71 U	

**Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results**

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM		Volatile Organic Compounds (VOC) by Method 8260				
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0035	9/24/2007	15 - 25	NA	NA	0.25 U	0.38 U	0.20 U	0.34 U	0.28 U
	7/1/2009	15 - 25	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	6.1
	10/25/2010	15 - 25	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	8.0
	9/22/2011	15 - 25	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	12
	11/1/2012	15 - 25	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	14
	11/6/2013	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	11
	11/12/2014	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	8.9
	11/4/2015	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	4.8
	11/17/2016	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	4.8
	11/13/2017	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	4.3
	11/7/2018	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	3.2
	11/25/2019	15 - 25	0.33 U	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	4.9
	11/17/2020	15 - 25	0.32 U	NA	0.22 U	0.35 U	0.22 U	0.28 U	4.5
	11/22/2021	15 - 25	0.050 U	NA	0.76 U	0.89 U	0.73 U	0.53 U	2.9
11/8/2022	15 - 25	0.091 U	NA	0.50 U	0.50 U	0.50 U	0.50 U	2.9	
11/6/2023	15 - 25	0.027 U	NA	NA	NA	NA	NA	0.71 U	
GSSP-MW0036	9/24/2007	30 - 40	NA	NA	0.25 U	0.38 U	0.20 U	0.28 U	7.1
	7/1/2009	30 - 40	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	23.5
	10/25/2010	30 - 40	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	39.4
	9/22/2011	30 - 40	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	29
	11/1/2012	30 - 40	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	25
	11/6/2013	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	17
	11/12/2014	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	8.7
	11/4/2015	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.7
	11/17/2016	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.4
	11/13/2017	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	3.0
	11/7/2018	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	1.4
	11/25/2019	30 - 40	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	2.0
	11/17/2020	30 - 40	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	2.0
	11/22/2021	30 - 40	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	1.8
11/8/2022	30 - 40	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
11/6/2023	30 - 40	NA	NA	NA	NA	NA	NA	0.71 U	
GSSP-MW0039	9/24/2007	25 - 35	NA	NA	0.25 U	0.38 U	0.20 U	0.28 U	0.34 U
	6/30/2009	25 - 35	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/6/2013	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	25 - 35	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0042	9/24/2007	30 - 40	NA	NA	0.25 U	0.38 U	0.20 U	0.28 U	0.34 U
	6/30/2009	30 - 40	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/1/2012	30 - 40	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.36 U
	11/6/2013	30 - 40	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/25/2019	30 - 40	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U

Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM</i>	<i>Volatile Organic Compounds (VOC) by Method 8260</i>					
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0043R	1/13/2009	5 - 15	NA	NA	0.22 U	0.32 U	2.9	99	4.0
	10/26/2010	5 - 15	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	2.8
	9/21/2011	5 - 15	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	2.1
	10/31/2012	5 - 15	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.54 I
	11/5/2013	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/11/2014	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/3/2015	5 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/22/2019	5 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
GSSP-MW0044R	1/13/2009	25 - 35	NA	NA	0.22 U	5.7	1.6	19.6	230
	10/26/2010	25 - 35	NA	NA	0.25 U	0.26 U	1.1	28.3	105
	9/21/2011	25 - 35	NA	NA	0.25 U	0.26 U	0.64 I	2.6	48.3
	10/31/2012	25 - 35	NA	NA	0.22 U	0.36 U	0.35 I	0.43 I	37
	11/5/2013	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	33
	11/11/2014	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	18
	11/3/2015	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.8
	11/17/2016	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/13/2017	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	1.5
	9/25/2018	25 - 35	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/22/2019	25 - 35	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	1.0
	11/17/2020	25 - 35	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
	11/22/2021	25 - 35	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/8/2022	25 - 35	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
11/6/2023	25 - 35	NA	NA	NA	NA	NA	NA	0.71 U	
GSSP-MW0053	9/11/2009	15 - 25	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	93.8
	10/25/2010	15 - 25	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	6.5
	9/21/2011	15 - 25	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	12.3
	10/31/2012	15 - 25	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	6.1
	11/5/2013	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	4.1
	11/10/2014	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.93 I	0.53 U	8.4
	11/4/2015	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	3.0
	11/17/2016	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	16
	11/13/2017	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	120
	9/25/2018	15 - 25	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	64
	11/22/2019	15 - 25	0.32 U	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	94.7
	11/17/2020	15 - 25	0.32 U	NA	0.22 U	0.35 U	0.22 U	0.28 U	79.1
	11/22/2021	15 - 25	0.069 I	NA	0.76 U	0.89 U	0.73 U	0.53 U	63
	11/8/2022	15 - 25	0.091 U	NA	0.50 U	0.50 U	0.50 U	0.50 U	75
11/6/2023	15 - 25	0.027 U	NA	NA	NA	NA	NA	63	
GSSP-MW0054	9/11/2009	25 - 35	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	38.8
	10/25/2010	25 - 35	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	3.8
	9/22/2011	25 - 35	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	4.3
	10/31/2012	25 - 35	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	1.9

Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM</i>	<i>Volatile Organic Compounds (VOC) by Method 8260</i>					
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0054 (Continued)	11/5/2013	25 - 35	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/4/2015	25 - 35	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
	11/17/2016	25 - 35	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
GSSP-MW0059	8/26/2010	16 - 21	NA	NA	2.2 U	25.4	35.9	365	477
	10/27/2010	16 - 21	NA	NA	0.25 U	0.76 I	24.3	47.2	477
	11/30/2010	16 - 21	NA	NA	0.25 U	0.26 U	13.5	0.26 U	25.6
	1/27/2011	16 - 21	NA	NA	0.25 U	0.26 U	12	0.26 U	0.76 I
	3/3/2011	16 - 21	NA	NA	0.25 U	0.26 U	15.3	0.26 U	0.29 I
	6/2/2011	16 - 21	NA	NA	0.25 U	0.26 U	8.9	0.26 U	0.22 U
	9/22/2011	16 - 21	NA	NA	0.25 U	0.26 U	0.35 U	0.26 U	0.38 I
	11/1/2012	16 - 21	NA	NA	0.22 U	0.36 U	0.19 U	0.36 U	0.36 U
	11/6/2013	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.81 I
	11/11/2014	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	3.3
	11/4/2015	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.2
	11/16/2016	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/14/2017	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	4.4
	9/25/2018	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.62 I	4.2
	11/22/2019	16 - 21	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.93 I
	11/17/2020	16 - 21	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	1.3
	11/22/2021	16 - 21	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	2.2
11/8/2022	16 - 21	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
11/6/2023	16 - 21	NA	NA	NA	NA	NA	NA	0.71 U	
GSSP-MW0060	8/25/2010	10 - 15	NA	NA	0.44 U	0.24 U	8.2	29.4	649
	10/27/2010	10 - 15	NA	NA	0.25 U	0.26 U	3.9	10.5	93.9
	11/29/2010	10 - 15	NA	NA	0.25 U	0.26 U	1.6	2.1	112
	1/27/2011	10 - 15	NA	NA	0.25 U	0.26 U	1.8	1.3	133
	3/4/2011	10 - 15	NA	NA	0.25 U	1.3	1.0	1.9	134
	6/2/2011	10 - 15	NA	NA	0.25 U	6.3	1.4	6.3	151
	9/22/2011	10 - 15	NA	NA	0.25 U	0.26 U	1.3	0.26 U	104
	11/1/2012	10 - 15	NA	NA	0.22 U	0.36 U	0.23 I	0.36 U	0.36 U
	11/6/2013	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	12
	11/11/2014	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.1
	11/4/2015	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	3.6
	11/16/2016	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	7.2
	11/14/2017	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	3.3
	9/25/2018	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.71 I	3.6
	11/22/2019	10 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	2.5
	11/17/2020	10 - 15	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	3.8
	11/22/2021	10 - 15	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	1.6
11/8/2022	10 - 15	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
11/6/2023	10 - 15	NA	NA	NA	NA	NA	NA	0.71 U	

Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM</i>	<i>Volatile Organic Compounds (VOC) by Method 8260</i>					
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0061	8/25/2010	16 - 21	NA	NA	0.88 U	110	6.4	110	232
	10/27/2010	16 - 21	NA	NA	0.25 U	4.4	4.9	147	216
	11/29/2010	16 - 21	NA	NA	0.25 U	2.2	2.0	28.9	138
	1/27/2011	16 - 21	NA	NA	0.25 U	0.74 I	0.66 I	6.8	70.5
	3/4/2011	16 - 21	NA	NA	0.25 U	2.0	0.59 I	5.3	53.1
	6/2/2011	16 - 21	NA	NA	0.25 U	0.26 I	0.35 U	0.76 I	46.6
	9/22/2011	16 - 21	NA	NA	0.25 U	0.26 U	0.41 I	0.26 U	77.5
	11/1/2012	16 - 21	NA	NA	0.22 U	0.36 U	0.76 I	0.36 U	0.36 U
	11/6/2013	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
	11/11/2014	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	1.1
	11/4/2015	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	0.89 I
	11/16/2016	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	9.1
	11/14/2017	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	4.5
	9/25/2018	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.78 I	5.9
	11/22/2019	16 - 21	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	0.48 I
	11/17/2020	16 - 21	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	0.41 U
	11/22/2021	16 - 21	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U
11/8/2022	16 - 21	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	
11/6/2023	16 - 21	NA	NA	NA	NA	NA	NA	0.71 U	
GSSP-MW0062	8/25/2010	10 - 15	NA	NA	0.46 I	39.8	6.8	31.1	1,340
	10/27/2010	10 - 15	NA	NA	0.25 U	5.3	16.9	213	743
	11/29/2010	10 - 15	NA	NA	0.25 U	0.26 U	9.6	4.9	639
	1/27/2011	10 - 15	NA	NA	0.25 U	0.26 U	16.4	1.7	144
	3/4/2011	10 - 15	NA	NA	0.25 U	0.26 U	15.8	2.5	132
	6/2/2011	10 - 15	NA	NA	0.25 U	0.26 U	11.1	1.1	78.7
	9/22/2011	10 - 15	NA	NA	0.25 U	0.26 U	6.0	0.53 I	91
	10/31/2012	10 - 15	NA	NA	0.22 U	0.36 U	1.1	0.95 I	180
	11/6/2013	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	54
	11/11/2014	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	17
	11/4/2015	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.83 I	38
	11/16/2016	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.80 I	27
	11/13/2017	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	1.4	34
	9/25/2018	10 - 15	NA	0.82 U	0.76 U	0.89 U	0.73 U	1.1	27
	11/22/2019	10 - 15	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	13.6
	11/17/2020	10 - 15	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	9.7
	11/22/2021	10 - 15	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	7.1
11/8/2022	10 - 15	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	5.6	
11/6/2023	10 - 15	NA	NA	NA	NA	NA	NA	0.71 U	

Table 4-2
General Services Administration Seized Property - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method 8270 SIM		Volatile Organic Compounds (VOC) by Method 8260				
Analyte			NAPHTHALENE	NAPHTHALENE	TETRACHLOROETHENE	TRICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	CIS-1,2-DICHLOROETHENE	VINYL CHLORIDE
FDEP GCTLs (µg/L)			14	14	3	3	100	70	1
FDEP NADCs (µg/L)			140	140	300	300	1000	700	100
Location ID	Sample Date	Screened Interval (ft bls)							
GSSP-MW0063	8/25/2010	16 - 21	NA	NA	0.44 U	1.1	0.51 I	3.0	87.2
	10/27/2010	16 - 21	NA	NA	0.25 U	1.2	0.69 I	2.9	93.5
	11/29/2010	16 - 21	NA	NA	0.25 U	0.62 I	1.3	12.9	147
	1/27/2011	16 - 21	NA	NA	0.25 U	0.26 U	2.1	1.1	234
	3/4/2011	16 - 21	NA	NA	0.25 U	0.26 U	1.2	0.64 I	51.6
	6/2/2011	16 - 21	NA	NA	0.25 U	0.84 I	4.4	1.4	38.5
	9/22/2011	16 - 21	NA	NA	0.25 U	0.26 U	8.6	8.3	91.2
	11/1/2012	16 - 21	NA	NA	0.22 U	0.36 U	2.6	6.1	340
	11/6/2013	16 - 21	NA	0.82 U	0.76 U	0.89 U	2.2	2.2	200
	11/11/2014	16 - 21	NA	1.6 U	1.5 U	1.8 U	1.5 U	1.1 U	130
	11/4/2015	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.74 I	61
	11/16/2016	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.90 I	15
	11/13/2017	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.68 I	5.3
	9/25/2018	16 - 21	NA	0.82 U	0.76 U	0.89 U	0.73 U	0.53 U	2.6
	11/22/2019	16 - 21	NA	1.0 U	0.22 U	0.35 U	0.22 U	0.28 U	1.8
	11/17/2020	16 - 21	NA	NA	0.22 U	0.35 U	0.22 U	0.28 U	1.2
11/22/2021	16 - 21	NA	NA	0.76 U	0.89 U	0.73 U	0.53 U	0.71 U	
11/8/2022	16 - 21	NA	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.74 I	
11/6/2023	16 - 21	NA	NA	NA	NA	NA	NA	0.71 U	

Notes:

FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table 1 (2005)

FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code, Table V (2005)

ft bls = feet below land surface

GSSP = General Services Administration Seized Property

MW = monitoring well

NA = Not Analyzed

Results and screening criteria presented in µg/L (micrograms per liter)

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

Highlighted cell indicates an exceedance of FDEP NADCs

I = Analyte greater than or equal to the method detection limit, but less than the practical quantitation limit

U = Analyte not detected

The numeric value presented for non-detects is the sample-specific reporting detection limit



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- Legend**
- Shallow Monitoring Well (2-15 feet bls)
 - Shallow-Intermediate Monitoring Well (15-25 feet bls)
 - Intermediate Monitoring Well (25-40 feet bls)
 - Deep Monitoring Well (40-60 feet bls)
 - Monitoring Well (Non-LTM)

- Notes:**
- (15-20) = Monitoring well screen interval in feet below land surface
 - Aerial Source: FDOT 2018
 - bls = below land surface
 - Gray icon = water level only
 - LTM = Long Term Monitoring
 - SWMU = Solid Waste Management Unit

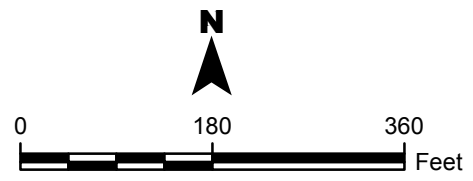


FIGURE 4-1
Site Map
 2023 - Industrial Area Long Term Monitoring
 General Services Administration Seized Property (GSSP)
 SWMU 095
 NASA Kennedy Space Center, Florida

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- Legend**
- Shallow Monitoring Well (5-15 ft bls)
 - Groundwater Contour (NAVD88 ft)
 - Approximate Direction of Groundwater Flow
 - (2.35) Groundwater Elevation Contour (NAVD88 ft.)

Notes:

- Vertical Datum is NAVD88 (US Foot)
- Monitoring Wells Were Gauged on November 6, 2023
- Groundwater Contour Interval = 0.50 Ft.
- (5-15) = Monitoring well screen interval in feet below land surface
- Aerial Source: FDOT 2018

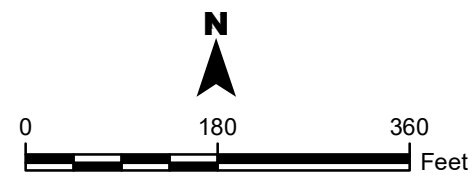
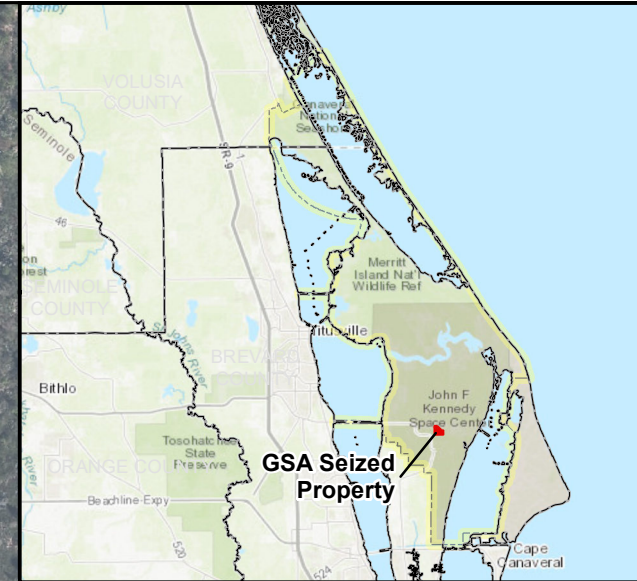


FIGURE 4-2
Shallow Zone Groundwater Elevation Map
November 2023
 2023 - Industrial Area Long Term Monitoring
 General Services Administration Seized Property (GSSP)
 SWMU 095
 NASA Kennedy Space Center, Florida



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- Legend**
- Shallow-Intermediate Monitoring Well (15-25 ft bls)
 - Groundwater Contour (NAVD88 ft)
 - Approximate Direction of Groundwater Flow
 - (2.56) Groundwater Elevation Contour (NAVD88 ft)

- Notes:**
- Vertical Datum is NAVD88 (US Foot)
 - Monitoring Wells Were Gauged on November 6, 2023
 - Groundwater Contour Interval = 0.50 ft
 - ft bls = feet below land surface
 - SWMU = Solid Waste Management Unit
 - Aerial Source: FDOT 2018
 - * = Not used in contouring

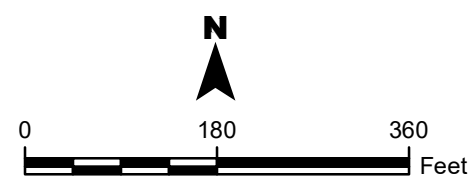


FIGURE 4-3
Shallow-Intermediate Zone Groundwater Elevation Map
November 2023
 2023 - Industrial Area Long Term Monitoring
 General Services Administration Seized Property (GSSP)
 SWMU 095
 NASA Kennedy Space Center, Florida

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- Legend**
- Intermediate Monitoring Well (25-40 ft bls)
 - Groundwater Contour (NAVD88 ft)
 - Approximate Direction of Groundwater Flow
 - (0.39) Groundwater Elevation Contour (NAVD88 ft)

- Notes:**
- Vertical Datum is NAVD88 (US Foot)
 - Monitoring Wells Were Gauged on November 6, 2023
 - Groundwater Contour Interval = 0.50 ft
 - Aerial Source: FDOT 2018
 - ft bls = feet below land surface
 - SWMU = Solid Waste Management Unit
 - *= Not used in contouring

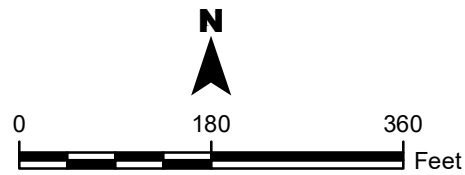


FIGURE 4-4
Intermediate Zone Groundwater Elevation Map
November 2023
 2023 - Industrial Area Long Term Monitoring
 General Services Administration Seized Property (GSSP)
 SWMU 095
 NASA Kennedy Space Center, Florida



Location ID	Date	GSSP-MW0035	GSSP-MW0035	GSSP-MW0035	GSSP-MW0035	GSSP-MW0035	GSSP-MW0035
Screen Interval	Sample Type	11/07/2018	11/25/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
15.0 - 25.0	NM	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.53 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		3.2	4.9	4.5	2.9	2.9	0.71 U
NAPHTHALENE		0.82 U	1.0 U	0.32 U	0.050 U	0.091 U	0.027 U

Location ID	Date	GSSP-MW0053	GSSP-MW0053	GSSP-MW0053	GSSP-MW0053	GSSP-MW0053	GSSP-MW0053
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
15.0 - 25.0	NM	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.53 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		64	94.7	79.1	63	75	63
NAPHTHALENE		0.82 U	1.0 U	0.32 U	0.069 U	0.091 U	0.027 U

Location ID	Date	GSSP-MW0019	GSSP-MW0019	GSSP-MW0019	GSSP-MW0019	GSSP-MW0019	GSSP-MW0019
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
15.0 - 25.0	NM	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0	15.0 - 25.0
Analyte							
TETRACHLOROETHENE		1.5 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		6.8	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		8.3	1.4	2.2	2.5	0.78 U	NA
TRANS-1,2-DICHLOROETHENE		2.3	1.6	1.1	1.0	0.74 U	NA
VINYL CHLORIDE		200	122	89.4	81	93	85

Location ID	Date	GSSP-MW0013	GSSP-MW0013	GSSP-MW0013	GSSP-MW0013	GSSP-MW0013	GSSP-MW0013
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
5.0 - 15.0	NM	5.0 - 15.0	5.0 - 15.0	5.0 - 15.0	5.0 - 15.0	5.0 - 15.0	5.0 - 15.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.53 U	0.53 U	0.54 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		0.71 U	9.7	10.3	6.4	0.50 U	0.71 U

Location ID	Date	GSSP-MW0061	GSSP-MW0061	GSSP-MW0061	GSSP-MW0061	GSSP-MW0061	GSSP-MW0061
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
16.0 - 21.0	NM	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.78 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		5.9	0.48 U	0.41 U	0.71 U	0.50 U	0.71 U

Location ID	Date	GSSP-MW0060	GSSP-MW0060	GSSP-MW0060	GSSP-MW0060	GSSP-MW0060	GSSP-MW0060
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
10.0 - 15.0	NM	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.71 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		3.6	2.8	3.8	1.6	0.50 U	0.71 U

Location ID	Date	GSSP-MW0059	GSSP-MW0059	GSSP-MW0059	GSSP-MW0059	GSSP-MW0059	GSSP-MW0059
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
16.0 - 21.0	NM	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.62 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		4.2	0.93 U	1.3	2.2	0.50 U	0.71 U

Location ID	Date	GSSP-MW0048	GSSP-MW0048	GSSP-MW0048	GSSP-MW0048	GSSP-MW0048	GSSP-MW0048
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
25.0 - 35.0	NM	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.53 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		0.71 U	1.0	0.41 U	0.71 U	0.50 U	0.71 U

Location ID	Date	GSSP-MW0020	GSSP-MW0020	GSSP-MW0020	GSSP-MW0020	GSSP-MW0020	GSSP-MW0020
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
25.0 - 35.0	NM	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0	25.0 - 35.0
Analyte							
TETRACHLOROETHENE		3.8 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		4.4 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		5.0	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		3.6 U	2.7	2.6	2.4	1.5	NA
VINYL CHLORIDE		450	271	235	220	230	180

Location ID	Date	GSSP-MW0063	GSSP-MW0063	GSSP-MW0063	GSSP-MW0063	GSSP-MW0063	GSSP-MW0063
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
16.0 - 21.0	NM	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0	16.0 - 21.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		0.53 U	0.28 U	0.28 U	0.53 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		2.6	1.8	1.2	0.73 U	0.74 U	0.71 U

Location ID	Date	GSSP-MW0062	GSSP-MW0062	GSSP-MW0062	GSSP-MW0062	GSSP-MW0062	GSSP-MW0062
Screen Interval	Sample Type	09/25/2018	11/22/2019	11/17/2020	11/22/2021	11/08/2022	11/06/2023
10.0 - 15.0	NM	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0	10.0 - 15.0
Analyte							
TETRACHLOROETHENE		0.76 U	0.22 U	0.22 U	0.76 U	0.50 U	NA
TRICHLOROETHENE		0.89 U	0.35 U	0.35 U	0.89 U	0.50 U	NA
CIS-1,2-DICHLOROETHENE		1.4	0.28 U	0.28 U	0.55 U	0.50 U	NA
TRANS-1,2-DICHLOROETHENE		0.73 U	0.22 U	0.22 U	0.73 U	0.50 U	NA
VINYL CHLORIDE		27	13.6	9.7	7.1	5.6	0.71 U

- Notes:
- LTM = Long Term Monitoring
 - MW = Monitoring Well
 - NM = Normal Sample
 - SWMU = Solid Waste Management Unit
 - NA = Not Analyzed
 - All results and screening criteria presented in µg/L.
 - I = Result is greater than or equal to the Method Detection Limit (MDL) but less than the Practical Quantitation Limit (PQL).
 - U = Result was below the laboratory Method Detection Limit (MDL).
 - FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels 62-777, F.A.C.
 - FDEP NADCs = Natural Attenuation Default Concentration 62-777, F.A.C.
 - Bolded results indicate the presence of an analyte at the specified concentration.
 - Blue font indicates an exceedance of FDEP GCTLs.
 - Red font indicates an exceedance of FDEP NADCs.
 - Aerial Source: ESRI 2018
 - Depth of monitoring well screen interval is presented in feet below land surface.

Legend

LTM Screen Interval, Monitoring Well Status, Exceedance Level

- Intermediate LTM Well, Sample Results Exceed NADC
- Intermediate LTM Well, Sample Results Exceed GCTL
- Intermediate LTM Well, Sample Results Below GCTL
- Shallow LTM Well, Sample Results Below GCTL
- Non-LTM Well, No Sample Results
- Intermediate Groundwater Elevation Contours - November 2023
- Approximate Extent of Contaminants of Concern Greater Than GCTLs from Monitoring Well Sampling
- Approximate Extent of Vinyl Chloride Greater Than NADCs from Monitoring Well Sampling

Analyte	GCTL	NADC
TETRACHLOROETHENE	3	300
TRICHLOROETHENE	3	300
CIS-1,2-DICHLOROETHENE	70	700
TRANS-1,2-DICHLOROETHENE	100	1000
VINYL CHLORIDE	1	100
NAPHTHALENE	14	140

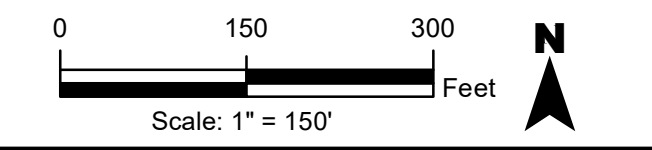


FIGURE 4-5
Groundwater Sampling Analytical Results

2023 - Industrial Area Long Term Monitoring
General Services Administration Seized Property (GSSP)
SWMU 095
NASA Kennedy Space Center, Florida

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5. SPACE STATION PROCESSING FACILITY

This section provides a summary of the SSPF site (SWMU 098) and un-ionized ammonia calculations. Refer to **Figure 5-1** for a site map.

5.1 SITE DESCRIPTION AND HISTORY

The SSPF is located in the northeast portion of the KSC IA at the southeast corner of the East Avenue South and 1st Street Southeast intersection. The SSPF was constructed in 1994 to service and process elements, payloads, and experiments for the International Space Station. The site is comprised of the SSPF Building, the Ammonia Vapor Containment Building, support buildings, and a hazardous waste storage area. A loading dock is located on the west side of the SSPF Building. Paved parking areas are located north and east of the SSPF Building, and a grassy area with a hiking trail exists north of the northern parking lot (NASA 2010).

Under Title V of the Clean Air Act, ammonia handling operations at SSPF are required to report releases of ammonia exceeding 100 pounds per day to FDEP. In 2005, releases of anhydrous ammonia in the vicinity of the Ammonia Vapor Containment Building were identified during the SWMU Assessment (LFR 2006). It was stated in the SWMU assessment that during International Space Station payload operations approximately 25 pounds of ammonia were released per day; however, three releases of ammonia that exceeded 100 pounds in a day were reported to FDEP. The first documented release occurred in 1996. Two of these reportable releases were related to operator error, and the third release was attributed to venting required for an emergency repair. Approximately 1,440 pounds of ammonia have been released in the vicinity of the Ammonia Vapor Containment Building (NASA 2010).

In 2006, confirmatory sampling was conducted at SSPF, results confirmed the presence of ammonia in groundwater at concentrations exceeding the GCTL. Between 2007 and 2009, an RFI was conducted to delineate the extent of ammonia in groundwater (LFR 2010). During the RFI, ammonia was detected at concentrations exceeding the GCTL, yet below the NADC. Following the RFI, an ammonia background study was performed center-wide at KSC to establish naturally occurring ammonia concentrations (LFR 2009). An ammonia background concentration of 1,860 µg/L was established in the background study. A cleanup goal was established for the groundwater at SSPF of 3,720 µg/L, which is two times the mean ammonia background concentration. Selection of MNA for groundwater was established to reduce ammonia concentrations below the established site cleanup goal (NASA 2010). In 2010, the site was included in the IA LTM Program on an annual sampling schedule. In 2012, the sampling frequency was changed to a biennial groundwater sampling schedule.

The following table shows the GCTL, NADC, and KSC background concentrations for ammonia:

COC	GCTL	NADC	KSCB	2x Mean KSCB	KSC Upper ROB
Ammonia	2,800	28,000	1,860	3,720	9,900

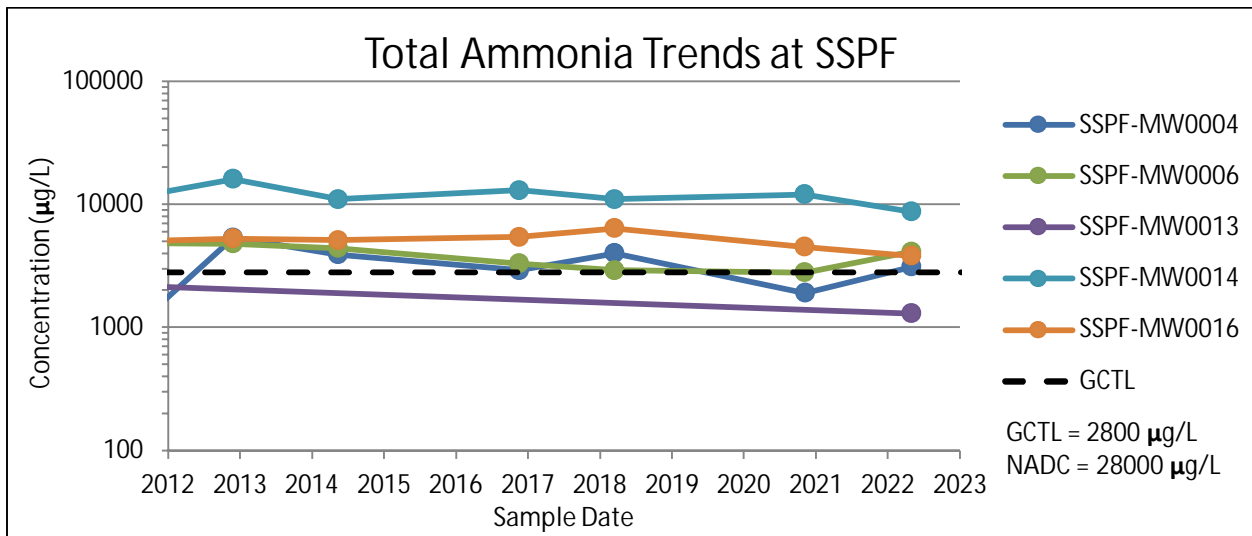
Concentration in µg/L

KSCB = Kennedy Space Center Background

ROB = Range of Background

5.2 TREND ANALYSIS

During the May 2022 sampling event, five monitoring wells were sampled and compared to historical sampling trends. The five select monitoring wells have exhibited a slow decrease in total ammonia concentration. Monitoring well SSPF-MW0013 remains below the GCTL, and ammonia was detected at a lower concentration in 2022 than its previous sample in 2010. The following trend chart shows the ammonia concentrations at SSPF since 2012.



A Mann-Kendall trend analysis was performed for total ammonia at SSPF, and the results are summarized in the following table. Sampling results, from the past 10 years of data, show that total ammonia concentrations are statistically stable or probably decreasing.

Mann-Kendall Statistics Summary Total Ammonia at SSPF	
Monitoring Well	Concentration Trend
SSPF-MW0004	Stable
SSPF-MW0006	Probably Decreasing
SSPF-MW0014	Stable
SSPF-MW0016	Stable

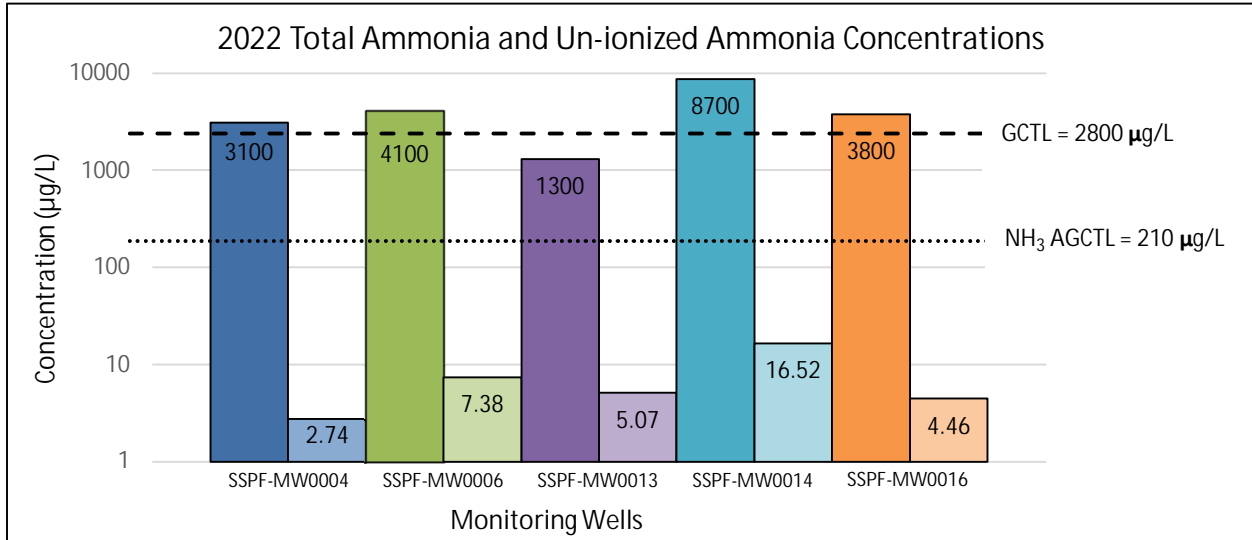
5.3 UN-IONIZED AMMONIA CALCULATIONS

Field activities have continued at SSPF through May 2022 with stable total ammonia concentrations exceeding the GCTL at select monitoring wells. Following the June 2023 IA LTM Advanced Data Package presentation, FDEP suggested KSCRT calculate the un-ionized ammonia (NH_3) concentrations at the site and evaluate the calculated concentrations against the alternative GCTL for un-ionized ammonia. Un-ionized ammonia is the more toxic component of total ammonia as it volatilizes more readily than ionized ammonia (NH_4^+), threatening human health via the inhalation exposure pathway (University of Florida 2015). The un-ionized ammonia calculator uses total ammonia concentrations and groundwater parameters (pH, temperature, and salinity) to calculate the proportion of un-ionized ammonia in a sample (FDEP n.d.) (FDEP 2001).

An un-ionized ammonia concentration was calculated for the two most recent sampling events, if available, for each monitoring well using the total ammonia concentration, pH, temperature, and salinity analyzed or recorded. Monitoring wells SSPF-MW0007 through SSPF-MW0012, SSPF-MW0015, and SSPF-MW0019 were only sampled once during the RFI; therefore, only one un-ionized ammonia concentration was calculated for these monitoring wells. Salinity data was not measured at the site prior to 2022; therefore, an average salinity measurement was used for each un-ionized ammonia calculation without an applicable salinity measurement. The average salinity measurement of 0.35 standard units (S.U.) was calculated using the salinity measurements for monitoring wells SSPF-MW0004, SSPF-MW0006, SSPF-MW0013, SSPF-MW0014, and SSPF-MW0016 recorded during the most recent sampling event in 2022.

The calculated un-ionized ammonia concentrations are below the alternative GCTL for un-ionized ammonia from each SSPF monitoring well except SSPF-MW0019; however, the total ammonia concentration in the groundwater sample from SSPF-MW0019 during that event was below the total ammonia GCTL. Monitoring well SSPF-MW0019 was sampled once during the RFI when the pH was measured at 8.96 S.U. Possible grout intrusion in the well screen causing the higher-than-average pH reading was noted on the corresponding groundwater sampling log. A high pH in groundwater significantly increases the calculated proportion of un-ionized ammonia from a total ammonia concentration.

The following chart shows the total ammonia concentrations from monitoring wells sampled in 2022 on the left and the calculated un-ionized ammonia concentrations on the right.



Total ammonia on the left
 Un-Ionized ammonia on the right
 NH₃ = un-ionized ammonia
 AGCTL = Alternative Groundwater Cleanup Target level

A complete SSPF monitoring well analytical history is provided in **Table 5-1** and a summary of the un-ionized ammonia calculation results is presented in **Table 5-2**. The 2022 un-ionized ammonia results are depicted on **Figure 5-2**.

5.4 CONCLUSION AND RECOMMENDATION

Total ammonia concentrations remain stable and continue to exceed the GCTL at monitoring well SSPF-MW0004 and two times the KSC average background concentration at monitoring wells SSPF-MW0006, SSPF-MW0014, and SSPF-MW0016. However, the calculated un-ionized ammonia concentrations are below the alternative GCTL except at monitoring well SSPF-MW0019. The total ammonia concentration at SSPF-MW0019 was below the GCTL when it was sampled in 2009, and therefore the monitoring well was not carried forward in the LTM program. The pH in monitoring well SSPF-MW0019 was measured higher than the site average in 2009 due to possible grout intrusion, causing a high calculated un-ionized ammonia result.

Groundwater LTM at SSPF is recommended to discontinue. Land use controls are recommended to remain in place as the facility continues to use ammonia in its regular operations.

Table 5-1
Space Station Processing Facility - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Ammonia by Method EPA 350.1</i>
Analyte			AMMONIA
FDEP GCTLs (µg/L)			2,800
2xKSC Background (µg/L)			3,720
FDEP NADCs (µg/L)			28,000
Location ID	Sample Date	Screened Interval (ft bls)	
SSPF-MW0001	9/25/2006	6 - 16	4,800
	5/22/2007	6 - 16	4,800
	10/29/2008	6 - 16	1,700
	2/12/2009	6 - 16	4,700
	8/12/2009	6 - 16	2,000
SSPF-MW0002	5/22/2007	6 - 16	1,700
	10/29/2008	6 - 16	790
	2/12/2009	6 - 16	1,800
SSPF-MW0003	5/22/2007	6 - 16	1,600
	10/29/2008	6 - 16	710
	2/12/2009	6 - 16	1,800
SSPF-MW0004	5/22/2007	6 - 16	7,400
	10/29/2008	6 - 16	7,100
	2/12/2009	6 - 16	3,000
	8/12/2009	6 - 16	5,400
	5/19/2010	6 - 16	2,100
	11/2/2010	6 - 16	6,790
	5/9/2011	6 - 16	5,850
	11/2/2011	6 - 16	1,450
	11/28/2012	6 - 16	5,360
	5/15/2014	6 - 16	3,900
	11/21/2016	6 - 16	2,900
	3/21/2018	6 - 16	4,000
	11/13/2020	6 - 16	1,900
5/10/2022	6 - 16	3,100	
SSPF-MW0005	10/29/2008	6 - 16	11,000
	2/12/2009	6 - 16	8,600
SSPF-MW0006	10/29/2008	6 - 16	10,000
	8/12/2009	6 - 16	13,000
	5/19/2010	6 - 16	8,400
	11/2/2010	6 - 16	10,500
	5/9/2011	6 - 16	6,450
	11/2/2011	6 - 16	4,790
	11/28/2012	6 - 16	4,780
	5/15/2014	6 - 16	4,400
	11/21/2016	6 - 16	3,300
	3/21/2018	6 - 16	2,900
	11/11/2020	6 - 16	2,800
5/10/2022	6 - 16	4,100	
SSPF-MW0007	10/29/2008	6 - 16	3,700
SSPF-MW0008	10/29/2008	16 - 26	2,600
SSPF-MW0009	10/29/2008	26 - 36	3,100
SSPF-MW0010	10/29/2008	6 - 16	2,700

Table 5-1
Space Station Processing Facility - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			<i>Ammonia by Method EPA 350.1</i>
Analyte			AMMONIA
FDEP GCTLs (µg/L)			2,800
2xKSC Background (µg/L)			3,720
FDEP NADCs (µg/L)			28,000
Location ID	Sample Date	Screened Interval (ft bls)	
SSPF-MW0011	10/29/2008	16 - 26	3,600
SSPF-MW0012	10/29/2008	26 - 36	2,300
SSPF-MW0013	10/29/2008	16 - 26	2,500
	5/19/2010	16 - 26	2,300
	5/10/2022	16 - 26	1,300
SSPF-MW0014	10/29/2008	6 - 16	15,000
	8/13/2009	6 - 16	17,000
	5/19/2010	6 - 16	16,000
	11/2/2010	6 - 16	19,200
	5/9/2011	6 - 16	19,400
	11/2/2011	6 - 16	12,300
	11/28/2012	6 - 16	16,000
	5/15/2014	6 - 16	11,000
	11/21/2016	6 - 16	13,000
	3/21/2018	6 - 16	11,000
	11/11/2020	6 - 16	12,000
5/10/2022	6 - 16	8,700	
SSPF-MW0015	10/29/2008	2 - 12	2,100
SSPF-MW0016	10/29/2008	11 - 21	4,900
	5/19/2010	11 - 21	3,600
	11/2/2010	11 - 21	4,040
	5/9/2011	11 - 21	4,960
	11/2/2011	11 - 21	5,070
	11/28/2012	11 - 21	5,240
	5/16/2014	11 - 21	5,100
	11/21/2016	11 - 21	5,400
	3/21/2018	11 - 21	6,400
	11/11/2020	11 - 21	4,500
5/10/2022	11 - 21	3,800	
SSPF-MW0017	10/29/2008	6 - 16	100
	11/2/2010	6 - 16	1,170

**Table 5-1
Space Station Processing Facility - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results**

Category			<i>Ammonia by Method EPA 350.1</i>
Analyte			AMMONIA
FDEP GCTLs (µg/L)			2,800
2xKSC Background (µg/L)			3,720
FDEP NADCs (µg/L)			28,000
Location ID	Sample Date	Screened Interval (ft bls)	
SSPF-MW0018	8/13/2009	6 - 16	8,500
	5/19/2010	6 - 16	6,800
	11/2/2010	6 - 16	7,870
	5/9/2011	6 - 16	8,150
	11/2/2011	6 - 16	6,470
	11/28/2012	6 - 16	8,490
	5/16/2014	6 - 16	7,200
	11/21/2016	6 - 16	1,800
	3/21/2018	6 - 16	2,700
SSPF-MW0019	8/13/2009	6 - 16	1,700
SSPF-MW0020	5/19/2010	6 - 16	50
	11/2/2010	6 - 16	183

Notes:

FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels,
Chapter 62-777 Florida Administrative Code, Table 1 (2005)

2xKSC Background = two times the background KSC levels, established in 2009

FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code,
Table V (2005)

ft bls = feet below land surface

SSPF = Space Station Processing Facility

MW = monitoring well

Results and screening criteria presented in µg/L (micrograms per liter)

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

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Table 5-2
Space Station Processing Facility - Long Term Monitoring (LTM)
Select Groundwater Sampling Analytical Results with Calculated Un-Ionized Ammonia Concentrations

Category			Total Ammonia by Method EPA 350.1	Un-ionized Ammonia by Ammonia Calculator V1.2	Groundwater Parameters		
Analyte			TOTAL AMMONIA	UN-IONIZED AMMONIA	pH (S.U.)	Temperature (°C)	Salinity (S.U.)
FDEP GCTLs (µg/L)			2,800	NV			
2xKSC Background (µg/L)			3,720	NV			
FDEP NADCs (µg/L)			28,000	NV			
Alternative GCTL (µg/L)			NV	210			
Screened Interval (ft bls)							
Location ID	Sample Date	Screened Interval (ft bls)					
SSPF-MW0001	2/12/2009	6 - 16	4,700	2.50	5.91	24.3	0.35*
	8/12/2009	6 - 16	2,000	0.66	5.56	29.1	0.35*
SSPF-MW0002	10/29/2008	6 - 16	790	0.54	5.96	26.3	0.35*
	2/12/2009	6 - 16	1,800	1.16	5.98	24.7	0.35*
SSPF-MW0003	10/29/2008	6 - 16	710	0.09	5.20	27.4	0.35*
	2/12/2009	6 - 16	1,800	0.56	5.66	24.9	0.35*
SSPF-MW0004	11/13/2020	6 - 16	1900	4.58	6.43	28.80	0.35*
	5/10/2022	6 - 16	3,100	2.74	6.06	26.60	0.26
SSPF-MW0005	10/29/2008	6 - 16	11,000	28.22	6.50	27.4	0.35*
	2/12/2009	6 - 16	8,600	12.61	6.37	23.7	0.35*
SSPF-MW0006	11/11/2020	6 - 16	2,800	6.40	6.35	30.70	0.35*
	5/10/2022	6 - 16	4,100	7.38	6.40	25.62	0.45
SSPF-MW0007	10/29/2008	6 - 16	3,700	7.93	6.44	26.8	0.35*
SSPF-MW0008	10/29/2008	16 - 26	2,600	12.30	6.80	26.3	0.35*
SSPF-MW0009	10/29/2008	26 - 36	3,100	17.44	6.90	25.5	0.35*
SSPF-MW0010	10/29/2008	6 - 16	2,700	5.39	6.40	27.1	0.35*
SSPF-MW0011	10/29/2008	16 - 26	3,600	16.20	6.76	26.9	0.35*
SSPF-MW0012	10/29/2008	26 - 36	2,300	17.73	7.01	26.4	0.35*
SSPF-MW0013	5/19/2010	16 - 26	2,300	31.51	7.35	23.50	0.35*
	5/10/2022	16 - 26	1,300	5.07	6.76	24.85	0.37
SSPF-MW0014	11/11/2020	6 - 16	12,000	19.24	6.19	30.90	0.35*
	5/10/2022	6 - 16	8,700	16.52	6.36	27.70	0.36
SSPF-MW0015	10/29/2008	2 - 12	2,100	2.74	6.24	26.3	0.35*
SSPF-MW0016	11/11/2020	11 - 21	4,500	3.07	5.83	30.5	0.35*
	5/10/2022	11 - 21	3,800	4.46	6.20	26.08	0.32
SSPF-MW0017	10/29/2008	6 - 16	100	0.34	6.67	25.8	0.35*
	11/2/2010	6 - 16	1,170	7.10	6.91	26.25	0.35*
SSPF-MW0018	11/21/2016	6 - 16	1,800	1.20	5.92	27.21	0.35*
	3/21/2018	6 - 16	2,700	0.67	5.55	25.31	0.35*

Table 5-2
Space Station Processing Facility - Long Term Monitoring (LTM)
Select Groundwater Sampling Analytical Results with Calculated Un-Ionized Ammonia Concentrations

Category			Total Ammonia by Method EPA 350.1	Un-ionized Ammonia by Ammonia Calculator V1.2	Groundwater Parameters		
Analyte			TOTAL AMMONIA	UN-IONIZED AMMONIA	pH (S.U.)	Temperature (°C)	Salinity (S.U.)
FDEP GCTLs (µg/L)			2,800	NV			
2xKSC Background (µg/L)			3,720	NV			
FDEP NADCs (µg/L)			28,000	NV			
Alternative GCTL (µg/L)			NV	210			
Screened Interval (ft bls)							
Location ID	Sample Date	Screened Interval (ft bls)					
SSPF-MW0019	8/13/2009	6 - 16	1,700	899.00	8.96**	30.8	0.35*
SSPF-MW0020	5/19/2010	6 - 16	50	0.05	6.15	26.07	0.35*
	11/2/2010	6 - 16	183	0.31	6.27	29.13	0.35*

Notes:

* = Average 2022 salinity level used for unavailable salinity data

** = Possible grout in well screen was noted on groundwater sampling log (would cause elevated pH)

Results and screening criteria presented in µg/L (micrograms per liter)

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels,

Chapter 62-777 Florida Administrative Code, Table 1 (2005)

2xKSC Background = two times the background KSC levels, established in 2009

FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code,

Table V (2005)

°C = degrees celcius

ft bls = feet below land surface

NV = no value

S.U. = standard units

Un-Ionized Ammonia Calculator v1.2. <https://floridadep.gov/waste/district-business-support/documents/un-ionized-ammonia-calculator>

Un-ionized ammonia limit was calculated in 2015 by the University of Florida

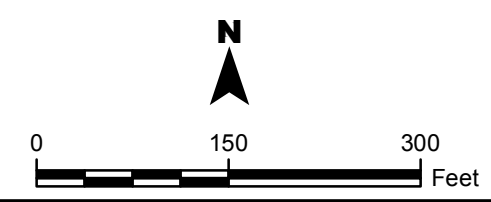


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- Legend**
- Monitoring Well (LTM)
 - Monitoring Well (LTM - Water Level Only)
 - Monitoring Well (Non - LTM)
 - Monitoring Well (Adjacent Site)

Notes:

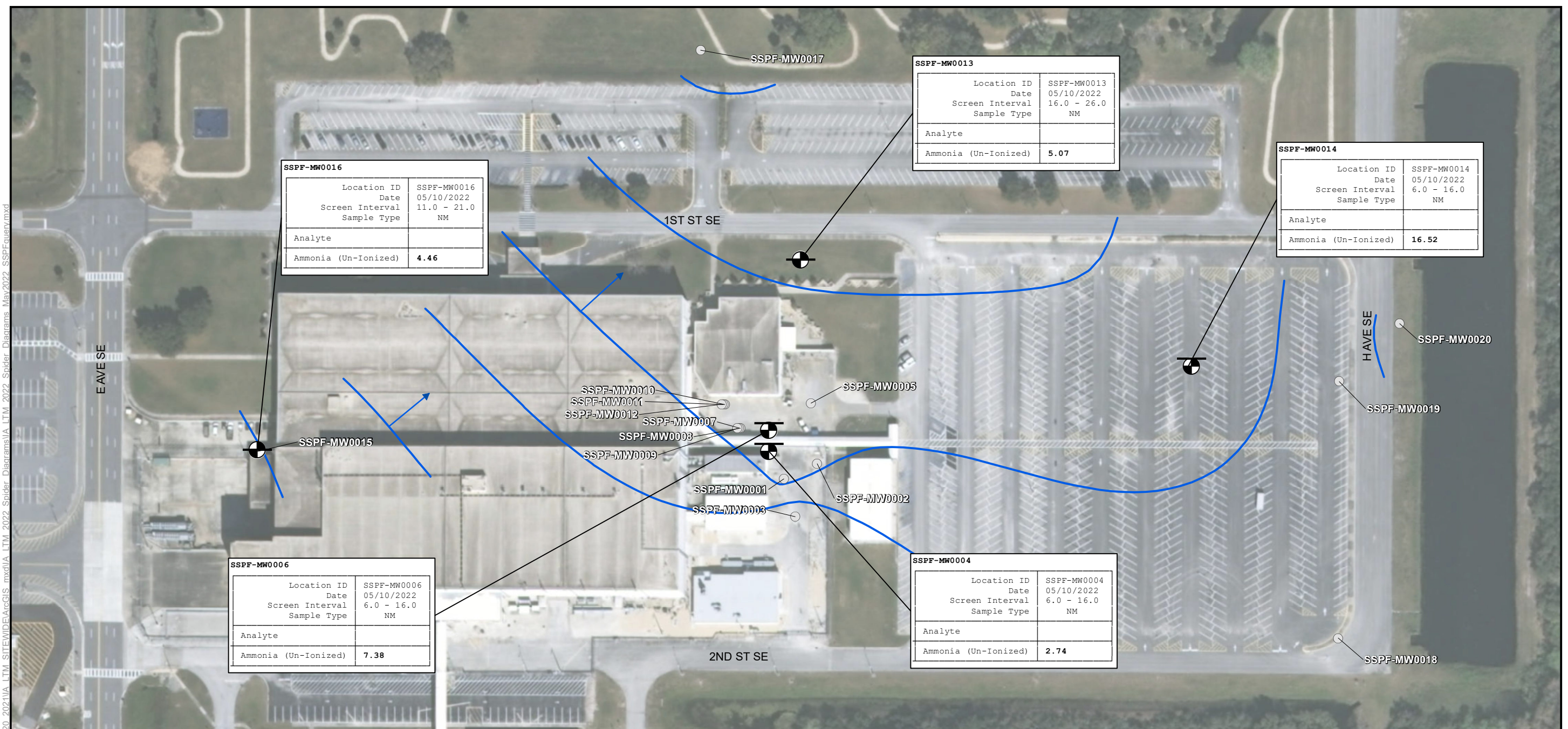
- (2-12) = Monitoring well screen interval in feet below land surface
- Long Term Monitoring (LTM)
- SWMU = Solid Waste Management Unit
- Aerial Source: FDOT 2018



**FIGURE 5-1
 Site Map**

2022 - Industrial Area Long Term Monitoring
 Space Station Processing Facility (SSPF)
 SWMU 098
 NASA Kennedy Space Center, Florida

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Location ID	SSPF-MW0016
Date	05/10/2022
Screen Interval	11.0 - 21.0
Sample Type	NM
Analyte	
Ammonia (Un-Ionized)	4.46

Location ID	SSPF-MW0013
Date	05/10/2022
Screen Interval	16.0 - 26.0
Sample Type	NM
Analyte	
Ammonia (Un-Ionized)	5.07

Location ID	SSPF-MW0014
Date	05/10/2022
Screen Interval	6.0 - 16.0
Sample Type	NM
Analyte	
Ammonia (Un-Ionized)	16.52

Location ID	SSPF-MW0006
Date	05/10/2022
Screen Interval	6.0 - 16.0
Sample Type	NM
Analyte	
Ammonia (Un-Ionized)	7.38

Location ID	SSPF-MW0004
Date	05/10/2022
Screen Interval	6.0 - 16.0
Sample Type	NM
Analyte	
Ammonia (Un-Ionized)	2.74

Legend

- Intermediate LTM Well, Sample Results Below AGCTL
- Shallow LTM Well, Sample Results Below AGCTL
- Non-LTM, No Sample Results
- Shallow Groundwater Elevation Contours - May 2022
- Direction of Groundwater Flow

- Notes:**
- AGCTL = Alternative Groundwater Cleanup Target Level
 - LTM = Long Term Monitoring
 - MW = Monitoring Well
 - NM = Normal Sample
 - SWMU = Solid Waste Management Unit
 - All results and screening criteria presented in µg/L.
 - Bolded** results indicate the presence of an analyte at the specified concentration.
 - Aerial Source: ESRI 2018.
 - Depth of monitoring well screen interval is presented in feet below land surface

Analyte	AGCTL
UN-IONIZED AMMONIA	210

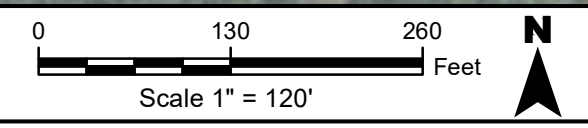


FIGURE 5-2
2022 Groundwater Un-Ionized Ammonia
Calculation Results

2022 - Industrial Area Long Term Monitoring
 Space Station Processing Facility (SSPF)
 SWMU 098
 NASA Kennedy Space Center, Florida

6. FUEL STORAGE AREA #1 UNDERGROUND STORAGE TANK (BUILDING 1044)

This section provides a summary of the FSA1 site (PRL 157). Refer to **Figure 6-1** for a site map.

6.1 SITE DESCRIPTION AND HISTORY

The FSA1 site is located on CCSFS, approximately 2 miles south of the CCSFS Industrial Area off of Samuel C Phillips Parkway and is bordered by the Banana River to the west. Since the 1950s, the site and surrounding area have been utilized for fuel storage and transfer activities. Current operations at FSA1 include receiving, storing, and dispensing of fuels and oxidizers, including anhydrous hydrazine, monomethyl hydrazine, dimethyl hydrazine, nitrogen tetroxide, rocket propellant (RP), and jet propellant (JP). The former Pump House Building 1044 Underground Storage Tank (UST) (PRL 157) is located within the boundaries of FSA1 and is part of the IA LTM Program.

The area surrounding former Building 1044 is topographically flat except for retention/detention areas that contain stormwater runoff from adjacent paved areas. During its operation, the site was comprised of a tanker loading/unloading area with associated fuel piping within a concrete containment area; Building 1044, which housed pumps for the fueling station; and an associated asphalt drive. A former RP/JP storage area, which consisted of five above ground storage tanks (ASTs), was located north of Building 1044. Concrete trenches were constructed to surround the tanker loading/unloading areas for spill containment. In 1990, a double-walled 2,500-gallon UST was installed west of Building 1044. A drain in the pump house (Building 1044) directed fluids to the UST until the drain was removed from service in 2006. Prior to the installation of the UST, the drain outfall was in the vicinity of the contaminant detention area (Tetra Tech 2009).

Several fuel spills have historically occurred at FSA1 resulting in soil and groundwater contamination. In 1989, 3,000 gallons of JP-5 spilled at the RP/JP facility due to an inoperative AST overflow protection device. In 1991, approximately 100 gallons of JP-5 fuel spilled onto the surface at the loading area and then was washed into the perimeter drain trench, which had open valves that directed the fuel into the detention area. In 2006, as a new waste fill container for the 2,500 gallon-UST was being installed, a leaking pipe flange was observed that showed signs of fuel leakage into the surrounding soils. The tank was properly closed in 2009 (Tetra Tech 2009).

From 2007 to 2009, site assessment activities were conducted to evaluate the potential soil and groundwater contamination associated with the UST. Petroleum-impacted soils containing total petroleum hydrocarbons (TPH), ethylbenzene, xylenes, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene exceeding SCTLs were found in areas west and south of Building 1044. Soil contamination was generally limited to the smear zone and no free product was observed (Tetra Tech 2009). A groundwater plume, limited to the area of the former UST

and loading area, corresponded to the area where soil exceeding leachability SCTLs was confirmed by the site assessment (Tetra Tech 2009).

The site assessment recommended NFA for soils due to disruptions that excavation would cause to facility operations, and because the SCTL leachability exceedances were limited to the smear zone in the area of groundwater contamination (Tetra Tech 2009). The site assessment recommended MNA for the groundwater impacts, and LTM sampling began at FSA1 in 2010. From 2010 through 2015, groundwater at FSA1 was sampled on a semi-annual schedule, which was changed to an annual schedule in 2016.

LTM results indicated increasing PAH concentrations at FSA1, so a supplemental direct push technology (DPT) investigation was performed in 2013 to 2015. The DPT supplemental investigation discovered free product south of FSA1-MW0002 (DPT location DPT1004). Additionally, the DPT work found petroleum soil contamination in the vicinity of FSA1-MW0001 and FSA1-MW0002 and beneath the loading area structure west of Facility 1044 at concentrations exceeding leachability SCTLs. Corresponding groundwater samples at these locations contained COCs exceeding NADCs. This residual soil contamination below the water table was concluded to be acting as a continuing source for the groundwater contamination present at FSA1. A Free Product Recovery IM, which included limited excavation, was proposed in the vicinity of DPT1004 (Jacobs-CORE 2016).

In summer 2017, the Free Product Recovery IM was performed, which included the construction of a recovery trench with a sump to remove potential free product near DPT location DPT1004, disposal of excavated soils from the recovery trench construction, and vacuum extraction of groundwater from the recovery trench and sump. Concentrations of TPH in previous soil samples were evaluated and used to maximize the effectiveness of the trench location for the IM. The trench location was placed within the TPH source area (defined as TPH concentrations greater than 10,000 milligrams per kilogram). A total of 34.05 tons of soil were excavated from the trench area and transported off-site for proper disposal. Approximately 4,421 gallons of groundwater were removed and disposed of at the CCSFS Trident Pretreatment Facility (Geosyntec 2018).

In October 2017 and March 2018, performance monitoring sampling was conducted to evaluate the effectiveness of the IM. Groundwater results indicated that TPH concentrations increased in monitoring well FSA1-MW0001, which is located upgradient from the IM trench, while the concentrations of TPH decreased, yet remained above the GCTL, in monitoring well FSA1-MW0002, which is located adjacent/downgradient from the IM trench. After the IM, TPH concentrations also decreased to below the GCTL in monitoring well FSA1-MW0021, which is located downgradient of the trench. Some increases in COC concentrations and seasonal fluctuations were also observed during the second performance monitoring event. Following the performance monitoring, FSA1 was moved back into the IA LTM Program on a semi-annual sampling schedule (Geosyntec 2018). LTM sampling resumed at FSA1 in September 2018.

Building 1044 and its associated piping and containment areas were demolished in April 2020 prior to a supplemental DPT assessment at FSA1. The area was leveled using clean fill and covered with grass. During the May 2020 sampling event, monitoring wells FSA1-MW0012 and FSA1-MW0022 were found damaged, likely from the demolition activities. These monitoring wells were replaced prior to the November 2020 sampling event. The sampling schedule was adjusted to the current annual frequency in alternating seasons following the November 2020 sampling event.

6.2 FIELD ACTIVITIES

Groundwater sampling was conducted at FSA1 in November 2023. Groundwater levels were measured at 18 monitoring wells and samples were collected at 10 monitoring wells. The following table shows the network of monitoring wells used for groundwater level measurements and sampling at FSA1.

Well ID	Screen Interval (ft bls)	Analysis
FSA1-MW0001	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0002	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0004	2-12	WL
FSA1-MW0012R	3-13	WL + Isopropylbenzene and select PAHs
FSA1-MW0014	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0015	3-13	WL
FSA1-MW0016A	3-13	WL
FSA1-MW0017A	3-13	WL + Isopropylbenzene and select PAHs
FSA1-MW0019	2-12	WL
FSA1-MW0020	1-11	WL
FSA1-MW0021	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0022R	3-13	WL + Isopropylbenzene and select PAHs
FSA1-MW0023	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0024	2-12	WL
FSA1-MW0025	15-25	WL
FSA1-MW0026	15-25	WL
FSA1-MW0027	15-25	WL + Isopropylbenzene and select PAHs
FSA1-MW0028	15-25	WL + Isopropylbenzene and select PAHs

ID = identification

Isopropylbenzene = isopropylbenzene analysis by Method 8260

MW = monitoring well

Select PAHs = 1-methylnaphthalene and 2-methylnaphthalene analysis by Method 8270

WL = water level measurement

The groundwater samples were analyzed for isopropylbenzene by Method 8260 and select PAHs by Method 8270. The following table shows the COCs for FSA1 with their respective GCTLs and NADCs.

COC	GCTL (µg/L)	NADC (µg/L)
Isopropylbenzene	0.8	8
1-Methylnaphthalene	28	280
2-Methylnaphthalene	28	280

6.3 WATER LEVEL COLLECTION AND GROUNDWATER FLOW DIRECTION

Groundwater levels collected during the 2023 sampling event were used to calculate groundwater elevations presented in **Table 6-1**. Groundwater elevations were used to determine the contours and flow direction for the shallow aquifer zone (1 ft bls to 13 ft bls) and the intermediate aquifer zone (15 ft bls to 25 ft bls). The groundwater flow directions in 2023 were consistent with the historical flow direction at the site: west to west-northwest. The groundwater flow contours are shown on **Figure 6-2** and **Figure 6-3**.

6.4 ANALYTICAL RESULTS

Groundwater at FSA1 was analyzed for isopropylbenzene and select PAHs in 2023. A summary of the analytical results is presented in **Table 6-2**. Analytical results are depicted on **Figure 6-4**.

Analytical results for each COC present at FSA1 are discussed below:

- Isopropylbenzene

In November 2023, isopropylbenzene was detected at concentrations above the GCTL in monitoring wells FSA1-MW0017A (4.0 µg/L) and FSA1-MW0021 (2.1 µg/L). The isopropylbenzene concentration in monitoring well FSA1-MW0001 (16 µg/L) exceeded both the GCTL and the NADC.

- 1-methylnaphthalene and 2-methylnaphthalene

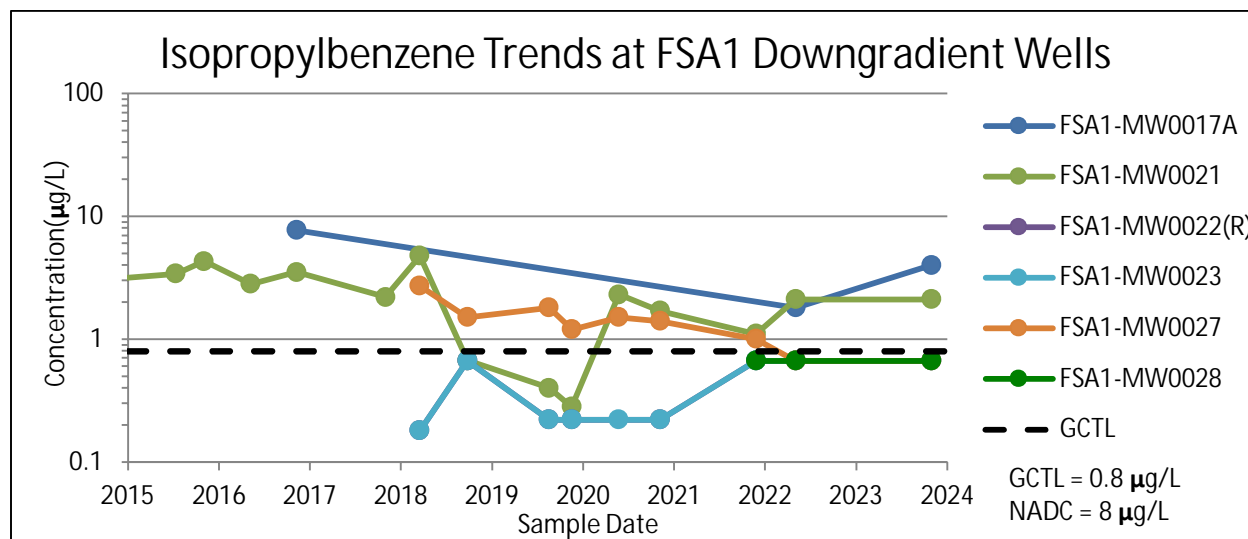
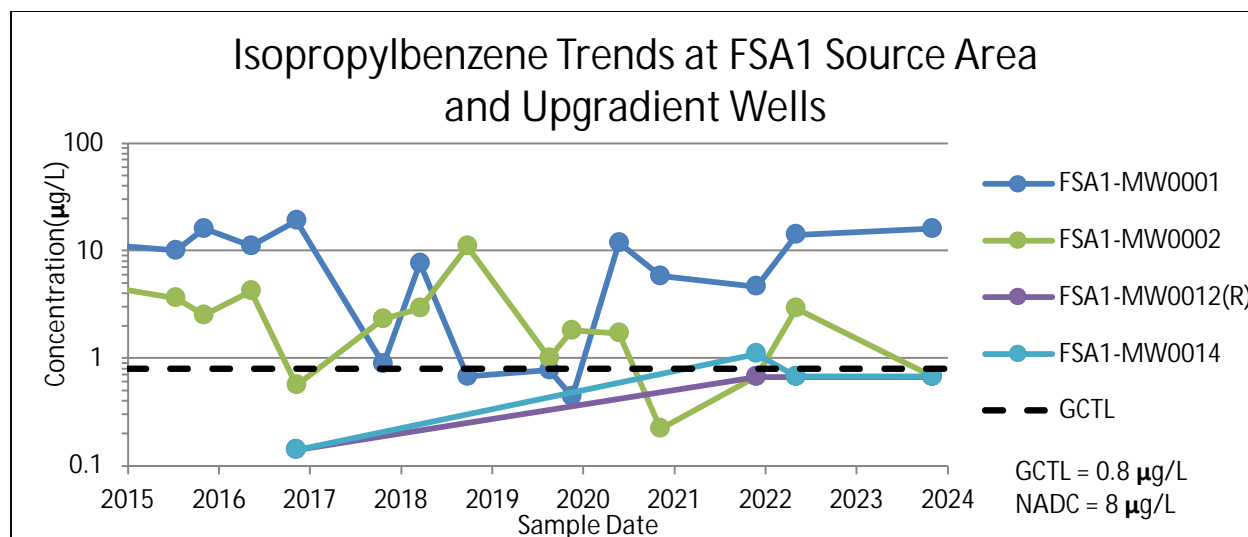
In November 2023, no 1-methylnaphthalene or 2-methylnaphthalene GCTL exceedances were present.

6.5 TREND ANALYSIS

Isopropylbenzene concentrations in monitoring wells FSA1-MW0001, FSA1-MW0002, and FSA1-MW0021 have been fluctuating above and below the GCTL during recent sampling events, and the concentrations at FSA1-MW0001 remain above NADC levels in 2023.

Isopropylbenzene concentrations at FSA1-MW0021 and FSA1-MW0017A continue to exceed the GCTL.

The following trend charts show the isopropylbenzene concentration trends since 2015.



6.6 CONCLUSION AND RECOMMENDATION

Isopropylbenzene concentrations remain above the GCTL at three monitoring wells, and monitoring well FSA1-MW0001 continues to exceed the NADC. 1- and 2-Methylnaphthalene concentrations were below GCTLs in 2023.

Annual LTM sampling is recommended to continue during alternating wet and dry seasons. Monitoring wells FSA1-MW0012R, FSA1-MW0014, and FSA1-MW0028 are recommended to be removed from the LTM Program for collection of groundwater samples based on concentrations below GCTLs for the past two or more consecutive sampling events. Monitoring wells FSA1-MW0012R and FSA1-MW0014 are located upgradient of the source area with a

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historically consistent groundwater flow pattern at the site. Monitoring well FSA1-MW0028 is located downgradient and has the same screen interval depth as monitoring well FSA1-MW0027, which remains in the LTM Program to monitor the intermediate zone downgradient of the former source area. Monitoring well FSA1-MW0019 is recommended to be added to the sampling list as a downgradient monitoring well to FSA1-MW0017A. The next sampling event is recommended to include 18 water level measurements and eight groundwater samples analyzed for isopropylbenzene and select PAHs (1-methylnaphthalene and 2-methylnaphthalene).

The following table shows the recommended monitoring wells for water level measurements and groundwater sampling for the next sampling event at FSA1 scheduled for May 2024.

Well ID	Screen Interval (ft bls)	Analysis
FSA1-MW0001	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0002	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0004	2-12	WL
FSA1-MW0012R	3-13	WL
FSA1-MW0014	2-12	WL
FSA1-MW0015	3-13	WL
FSA1-MW0016A	3-13	WL
FSA1-MW0017A	3-13	WL + Isopropylbenzene and select PAHs
FSA1-MW0019	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0020	1-11	WL
FSA1-MW0021	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0022R	3-13	WL + Isopropylbenzene and select PAHs
FSA1-MW0023	2-12	WL + Isopropylbenzene and select PAHs
FSA1-MW0024	2-12	WL
FSA1-MW0025	15-25	WL
FSA1-MW0026	15-25	WL
FSA1-MW0027	15-25	WL + Isopropylbenzene and select PAHs
FSA1-MW0028	15-25	WL

ID = identification

Isopropylbenzene = isopropylbenzene analysis by Method 8260

MW = monitoring well

Select PAHs = 1-methylnaphthalene and 2-methylnaphthalene analysis by Method 8270

WL = water level measurement

Table 6-1
Fuel Storage Area #1 Underground Storage Tank (Building 1044) - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

SHALLOW WELL ID:	FSA1-MW0001		FSA1-MW0002		FSA1-MW0004	
Screen Interval (ft bls):	2 - 12		2 - 12		2 - 12	
TOC Elevation (ft NAVD88):	5.35		4.59		5.48	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
August 2013	4.48	0.87	3.91	0.68	4.60	0.88
November 2013	5.14	0.21	4.52	0.07	5.04	0.44
May 2014	5.20	0.15	4.63	-0.04	5.32	0.16
November 2014	4.28	1.07	3.53	1.06	4.44	1.04
July 2015	5.67	-0.32	5.14	-0.55	5.68	-0.20
November 2015	4.43	0.92	3.77	0.82	4.53	0.95
May 2016	4.63	0.72	4.20	0.39	4.82	0.66
November 2017	2.99	2.36	2.56	2.03	2.72	2.76
March 2018	4.83	0.52	4.24	0.35	4.89	0.59
September 2018	5.20	0.15	5.23	-0.64	5.30	0.18
August 2019	3.63	1.72	3.03	1.56	3.59	1.89
November 2019	3.38	1.97	2.78	1.81	3.25	2.23
May 2020	4.63	0.72	3.88	0.71	4.72	0.76
November 2020	3.90	1.45	3.23	1.36	3.98	1.50
November 2021	4.03	1.32	3.35	1.24	4.10	1.38
May 2022	4.82	0.53	4.19	0.40	4.93	0.55
November 2023	4.30	1.05	3.60	0.99	4.39	1.09

SHALLOW WELL ID:	FSA1-MW0012		FSA1-MW0012R		FSA1-MW0014	
Screen Interval (ft bls):	3 - 13		3 - 13		2 - 12	
TOC Elevation (ft NAVD88):	5.81		5.77		6.04	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
August 2013	4.81	1.00	Not Installed		4.86	1.18
November 2013	5.33	0.48	--	--	5.53	0.51
May 2014	5.51	0.30	--	--	5.70	0.34
November 2014	4.74	1.07	--	--	4.86	1.18
July 2015	5.85	-0.04	--	--	5.97	0.07
November 2015	4.84	0.97	--	--	4.96	1.08
May 2016	5.06	0.75	--	--	5.13	0.91
November 2017	2.98	2.83	--	--	2.48	3.56
March 2018	5.12	0.69	--	--	5.14	0.90
September 2018	5.40	0.41	--	--	5.30	0.74
August 2019	3.78	2.03	--	--	3.80	2.24
November 2019	3.43	2.38	--	--	3.29	2.75
May 2020	Abandoned		--	--	5.07	0.97
November 2020	--	--	4.20	1.57	4.29	1.75
November 2021	--	--	4.32	1.45	4.50	1.54
May 2022	--	--	5.04	0.73	5.13	0.91
November 2023	--	--	4.57	1.20	4.74	1.30

SHALLOW WELL ID:	FSA1-MW0015		FSA1-MW0016A		FSA1-MW0017A	
Screen Interval (ft bls):	3 - 13		3 - 13		3 - 13	
TOC Elevation (ft NAVD88):	4.32		5.60		5.46	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
August 2013	3.71	0.61	5.09	0.51	5.04	0.42
November 2013	3.99	0.33	5.29	0.31	5.13	0.33
May 2014	4.31	0.01	5.71	-0.11	5.55	-0.09
November 2014	3.37	0.95	4.75	0.85	4.58	0.88
July 2015	4.62	-0.30	6.06	-0.46	6.04	-0.58
November 2015	3.52	0.80	4.87	0.73	4.67	0.79
May 2016	3.87	0.45	5.16	0.44	5.11	0.35
November 2017	2.38	1.94	3.63	1.97	3.70	1.76
March 2018	3.98	0.34	5.36	0.24	5.31	0.15
September 2018	5.45	-1.13	5.80	-0.20	5.80	-0.34
August 2019	2.90	1.42	3.89	1.71	4.20	1.26
November 2019	2.59	1.73	3.90	1.70	3.93	1.53
May 2020	3.58	0.74	5.01	0.59	4.86	0.60
November 2020	3.04	1.28	4.33	1.27	4.28	1.18
November 2021	3.17	1.15	4.48	1.12	4.40	1.06
May 2022	4.00	0.32	5.49	0.11	5.43	0.03
November 2023	3.39	0.93	4.70	0.90	4.60	0.86

Table 6-1
Fuel Storage Area #1 Underground Storage Tank (Building 1044) - Long Term Monitoring (LTM)
Monitoring Well Groundwater Elevations

SHALLOW WELL ID:	FSA1-MW0019		FSA1-MW0020		FSA1-MW0021	
Screen Interval (ft bls):	2 - 12		1 - 11		2 - 12	
TOC Elevation (ft NAVD88):	7.49		4.68		4.30	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
August 2013	7.15	0.34	4.19	0.49	3.85	0.45
November 2013	7.21	0.28	4.34	0.34	3.97	0.33
May 2014	7.63	-0.14	4.78	-0.10	4.42	-0.12
November 2014	6.74	0.75	3.82	0.86	3.41	0.89
July 2015	8.13	-0.64	5.18	-0.50	4.91	-0.61
November 2015	6.76	0.73	3.91	0.77	3.56	0.74
May 2016	7.16	0.33	4.27	0.41	3.89	0.41
November 2017	6.94	0.55	2.81	1.87	2.45	1.85
March 2018	7.43	0.06	4.45	0.23	4.11	0.19
September 2018	7.80	-0.31	5.74	-1.06	5.70	-1.40
August 2019	6.31	1.18	3.29	1.39	2.74	1.56
November 2019	6.01	1.48	3.05	1.63	2.68	1.62
May 2020	6.97	0.52	4.10	0.58	3.72	0.58
November 2020	6.38	1.11	3.49	1.19	3.05	1.25
November 2021	6.45	1.04	3.63	1.05	3.03	1.27
May 2022	7.55	-0.06	4.57	0.11	4.19	0.11
November 2023	6.68	0.81	3.80	0.88	3.45	0.85

SHALLOW WELL ID:	FSA1-MW0022		FSA1-MW0022R		FSA1-MW0023	
Screen Interval (ft bls):	2 - 12		3 - 13		2 - 12	
TOC Elevation (ft NAVD88):	5.97		5.73		5.32	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
March 2018	6.05	-0.08	Not Installed		5.26	0.06
September 2018	6.25	-0.28	--	--	5.42	-0.10
August 2019	4.23	1.74	--	--	3.68	1.64
November 2019	4.39	1.58	--	--	3.61	1.71
May 2020	Abandoned		--	--	4.78	0.54
November 2020	--	--	4.65	1.08	3.96	1.36
November 2021	--	--	4.59	1.14	3.85	1.47
May 2022	--	--	5.83	-0.10	5.05	0.27
November 2023	--	--	4.90	0.83	4.33	0.99

SHALLOW WELL ID:	FSA1-MW0024	
Screen Interval (ft bls):	2 - 12	
TOC Elevation (ft NAVD88):	5.36	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
March 2018	5.51	-0.15
September 2018	4.80	0.56
August 2019	3.10	2.26
November 2019	2.70	2.66
May 2020	4.35	1.01
November 2020	3.61	1.75
November 2021	3.72	1.64
May 2022	4.48	0.88
November 2023	3.98	1.38

INTERMEDIATE WELL ID:	FSA1-MW0025		FSA1-MW0026		FSA1-MW0027	
Screen Interval (ft bls):	15 - 25		15 - 25		15 - 25	
TOC Elevation (ft NAVD88):	4.40		5.66		5.97	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
March 2018	4.30	0.10	5.77	-0.11	6.12	-0.15
September 2018	4.55	-0.15	6.00	-0.34	6.31	-0.34
August 2019	3.85	0.55	4.40	1.26	4.68	1.29
November 2019	2.64	1.76	4.16	1.50	4.50	1.47
May 2020	3.78	0.62	5.20	0.46	5.53	0.44
November 2020	3.15	1.25	4.52	1.14	4.85	1.12
November 2021	3.20	1.20	4.59	1.07	4.85	1.12
May 2022	4.20	0.20	5.75	-0.09	6.15	-0.18
November 2023	3.43	0.97	4.83	0.83	5.11	0.86

INTERMEDIATE WELL ID:	FSA1-MW0028	
Screen Interval (ft bls):	15 - 25	
TOC Elevation (ft NAVD88):	5.67	
Date	Depth to Water (ft BTOC)	Water Elevation (ft NAVD88)
November 2021	4.62	1.05
May 2022	5.95	-0.28
November 2023	4.88	0.79

Notes:
bls = below land surface
BTOC = below top of casing
FSA1 = Fuel Storage Area #1 Underground Storage Tank (Building 1044)
ft = feet
MW = monitoring well
NAVD88 = North American Vertical Datum of 1988
TOC = top of casing

Table 6-2
Fuel Storage Area #1 Underground Storage Tank (Building 1044) - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method SW8270 SIM			Volatile Organic Compounds (VOC) by Method 8260				FLO PRO
Analyte			1-METHYL NAPHTHALENE	2-METHYL NAPHTHALENE	NAPHTHALENE	NAPHTHALENE	BENZENE	ETHYLBENZENE	ISOPROPYL BENZENE	TPH (C08-C40)
FDEP GCTLs (µg/L)			28	28	14	14	1	30	0.8	5,000
FDEP NADCs (µg/L)			280	280	140	140	100	300	8	50,000
Location ID	Sample Date	Screened Interval (ft bls)								
FSA1-MW0001	1/23/2008	2 - 12	116	131	250	NA	15.9	40.6	NA	9,040
	10/22/2009	2 - 12	140	190	320	NA	0.52 U	14	NA	3,200
	5/18/2010	2 - 12	130	140	310	NA	0.066 U	30	54	3,600
	11/2/2010	2 - 12	100	120	14	NA	0.21 U	8.08	39	3,500 J
	5/3/2011	2 - 12	48.7	49.3	103	NA	0.21 U	1.42	23.1	1,450
	10/31/2011	2 - 12	38.4	8.52	32.5	NA	0.21 U	0.37 I	8.03	11,800
	6/26/2012	2 - 12	52.3	45.6	102	NA	0.21 U	0.40 I	14.1	12,400
	11/27/2012	2 - 12	30.1	28.7	53.1	NA	0.21 U	0.35 I	14	4,270
	8/15/2013	2 - 12	28	20	53	130	0.71 U	0.69 U	14	4,800
	11/5/2013	2 - 12	62	54	140	130	0.71 U	0.69 U	12	3,400
	5/14/2014	2 - 12	80	63	160	130	0.71 U	0.69 U	12	1,200
	7/13/2015	2 - 12	23	1.8	30	91	0.71 U	0.69 U	10	2,600
	11/3/2015	2 - 12	56	12	84	97	0.71 U	0.69 U	16	690
	5/10/2016	2 - 12	41	14	63	59	0.71 U	0.69 U	11	2,500
	11/9/2016	2 - 12	16	7.3	34	NA	0.16 U	0.24 U	19	4,700
	10/23/2017	2 - 12	1.6	0.75	3.4	NA	0.16 U	0.24 U	0.88 I	880
	3/19/2018	2 - 12	40	33	62	NA	0.32 U	0.48 U	7.6	20,000
	9/27/2018	2 - 12	0.047 U	0.044 U	0.057 I	0.82 U	0.71 U	0.69 U	0.67 U	100 U
	8/21/2019	2 - 12	0.79 I	0.49 I	2.0	4.6 I	0.31 U	0.36 U	0.77 I	550
	11/21/2019	2 - 12	4.4	3.0	7.0	8.0	0.31 U	0.36 U	0.44 I	1,500 J
5/27/2020	2 - 12	16.9	16.5	14.4	NA	0.31 U	0.36 U	11.8	13,100	
11/9/2020	2 - 12	17.6	15.1	12.2	NA	0.31 U	0.36 U	5.8	6,210	
11/30/2021	2 - 12	3.4	3.0	2.9	NA	NA	NA	4.6	1,300	
5/9/2022	2 - 12	33	34	14	NA	NA	NA	14	1,600	
11/7/2023	2 - 12	15	14	NA	NA	NA	NA	16	NA	
FSA1-MW0002	1/23/2008	2 - 12	0.25 U	0.25 U	0.25 U	NA	0.20 U	0.20 U	NA	346
	10/22/2009	2 - 12	14	12	20	NA	0.52 U	0.10 U	NA	3,900 J
	5/18/2010	2 - 12	12	9.0	16	NA	0.066 U	0.52 U	3.3	13,000
	11/2/2010	2 - 12	17	15	43	NA	0.21 U	0.21 U	3.75	39,000
	5/3/2011	2 - 12	16.9	4.97	20.9	NA	0.21 U	0.38 I	3.54	36,500
	10/31/2011	2 - 12	1.7	0.638	2.37	NA	0.21 U	0.21 U	0.81 I	15,400
	6/26/2012	2 - 12	5.3	3.09	11.8	NA	0.21 U	0.21 U	2.2	30,100
	11/27/2012	2 - 12	15.5	7.53	48.7	NA	0.21 U	0.21 U	3.6	19,100
	8/15/2013	2 - 12	16	11	51	110	0.71 U	0.69 U	3.2	54,000
	11/5/2013	2 - 12	13	9.2	50	50	0.71 U	0.69 U	3.3	22,000
5/14/2014	2 - 12	13	22	41	45	0.71 U	0.69 U	5.3	12,000	

Table 6-2
Fuel Storage Area #1 Underground Storage Tank (Building 1044) - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method SW8270 SIM			Volatile Organic Compounds (VOC) by Method 8260				FLO PRO
Analyte			1-METHYL NAPHTHALENE	2-METHYL NAPHTHALENE	NAPHTHALENE	NAPHTHALENE	BENZENE	ETHYLBENZENE	ISOPROPYL BENZENE	TPH (C08-C40)
FDEP GCTLs (µg/L)			28	28	14	14	1	30	0.8	5,000
FDEP NADCs (µg/L)			280	280	140	140	100	300	8	50,000
Location ID	Sample Date	Screened Interval (ft bls)								
FSA1-MW0002 (continued)	7/13/2015	2 - 12	20	11	53	74	0.71 U	0.69 U	3.6	18,000
	11/3/2015	2 - 12	5.8	3.6	40	40	0.71 U	0.69 U	2.5	30,000
	5/10/2016	2 - 12	17	7.1	39	44	0.71 U	0.69 U	4.2	13,000
	11/9/2016	2 - 12	1.1	0.53	3.8	NA	0.64 U	0.96 U	0.56 U	33,000
	10/23/2017	2 - 12	1.5	0.77	6.4	NA	0.16 U	0.24 U	2.3	7,500
	3/19/2018	2 - 12	15	9.1	18	NA	0.32 U	0.48 U	2.9	9,500
	9/27/2018	2 - 12	29	28	53	78	0.71 U	0.69 U	11	4,600
	8/21/2019	2 - 12	0.33 U	0.33 U	0.33 U	1.0 U	0.31 U	0.36 U	0.22 U	10,700
	11/21/2019	2 - 12	2.6	1.1	1.3	1.1 I	0.31 U	0.36 U	1.8	8270 J
	5/27/2020	2 - 12	1.6 U	1.6 U	1.6 U	NA	0.31 U	0.36 U	1.7	27,000
	11/9/2020	2 - 12	0.32 U	0.32 U	0.32 U	NA	0.31 U	0.36 U	0.22 U	5,610
	11/30/2021	2 - 12	0.050 U	0.050 U	0.13	NA	NA	NA	0.67 U	100 U
	5/9/2022	2 - 12	0.50	0.29	1.6	NA	NA	NA	2.9	1,100
	11/7/2023	2 - 12	0.038 I	0.039 U	NA	NA	NA	NA	0.67 U	NA
FSA1-MW0012	5/23/2007	3 - 13	0.96 U	0.96 U	0.96 U	NA	0.5 U	0.5 U	NA	4,110
	11/8/2016	3 - 13	0.20 U	0.20 U	0.19 U	NA	NA	NA	0.14 U	600 U
FSA1-MW0012R	11/30/2021	3 - 13	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	100 U
	5/9/2022	3 - 13	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	100 U
	11/7/2023	3 - 13	0.032 U	0.039 U	NA	NA	NA	NA	0.67 U	NA
FSA1-MW0014	11/8/2016	2 - 12	0.20 U	0.20 U	0.19 U	NA	NA	NA	0.14 U	600 U
	11/30/2021	2 - 12	0.050 U	0.050 U	0.23	NA	NA	NA	1.1	100 U
	5/9/2022	2 - 12	0.074 I	0.057 I	0.080 I	NA	NA	NA	0.67 U	100 U
	11/7/2023	2 - 12	0.11 I	0.044 I	NA	NA	NA	NA	0.67 U	NA
FSA1-MW0017A	11/9/2016	3 - 13	0.20 U	0.20 U	0.19 U	NA	NA	NA	7.7	6,500
	5/9/2022	3 - 13	0.050 U	0.050 U	0.20	NA	NA	NA	1.8	100 U
	11/7/2023	3 - 13	0.032 U	0.039 U	NA	NA	NA	NA	4.0	NA
FSA1-MW0019	1/23/2008	3 - 13	0.8 I	0.27 U	1.0 I	NA	NA	NA	NA	7,570
	5/6/2008	3 - 13	NA	NA	NA	NA	NA	NA	NA	2,570
	4/29/2009	3 - 13	NA	NA	NA	NA	NA	NA	NA	1,830

Table 6-2
Fuel Storage Area #1 Underground Storage Tank (Building 1044) - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method SW8270 SIM			Volatile Organic Compounds (VOC) by Method 8260				FLO PRO
Analyte			1-METHYL NAPHTHALENE	2-METHYL NAPHTHALENE	NAPHTHALENE	NAPHTHALENE	BENZENE	ETHYLBENZENE	ISOPROPYL BENZENE	TPH (C08-C40)
FDEP GCTLs (µg/L)			28	28	14	14	1	30	0.8	5,000
FDEP NADCs (µg/L)			280	280	140	140	100	300	8	50,000
Location ID	Sample Date	Screened Interval (ft bls)								
FSA1-MW0021	8/15/2013	2 - 12	0.047 U	0.044 U	0.035 U	0.82 U	0.71 U	0.69 U	0.67 U	100 U
	11/5/2013	2 - 12	0.047 U	0.080 I	0.78	1.4	0.71 U	0.69 U	0.84 I	1,300
	5/14/2014	2 - 12	5.9	3.1	62	57	0.71 U	0.69 U	2.9	18,000
	7/13/2015	2 - 12	16	6.7	32	37	0.71 U	0.69 U	3.4	14,000
	11/3/2015	2 - 12	20	9.2	52	77	0.71 U	0.69 U	4.3	18,000
	5/10/2016	2 - 12	22	22	69	42	0.71 U	0.69 U	2.8	29,000
	11/9/2016	2 - 12	5.0	1.4	15	NA	0.48 U	0.72 U	3.5	26,000
	11/2/2017	2 - 12	3.6	0.39	3.7	4.0	0.71 U	0.69 U	2.2	2,600
	3/20/2018	2 - 12	12	4.1	15	18	0.71 U	0.69 U	4.8	4,300
	9/27/2018	2 - 12	0.047 U	0.044 U	0.13	0.82 U	0.71 U	0.69 U	0.67 U	100 U
	8/21/2019	2 - 12	0.33 U	0.33 U	0.33 U	1.0 U	0.31 U	0.36 U	0.40 I	689
	11/21/2019	2 - 12	0.36 U	0.36 U	0.36 U	1.0 U	0.31 U	0.36 U	0.28 I	4,050 J
	5/27/2020	2 - 12	1.2	0.49 I	2.0	NA	0.31 U	0.36 U	2.3	9,200
	11/9/2020	2 - 12	0.32 U	0.32 U	0.46 I	NA	0.31 U	0.36 U	1.7	7,990
	11/30/2021	2 - 12	0.050 U	0.050 U	0.091 I	NA	NA	NA	1.1	100 U
5/9/2022	2 - 12	0.050 U	0.050 U	0.11	NA	NA	NA	2.1	100 U	
11/7/2023	2 - 12	0.84	0.039 U	NA	NA	NA	NA	2.1	NA	
FSA1-MW0022	3/19/2018	2 - 12	0.20 U	0.20 U	0.19 U	NA	0.16 U	0.24 U	0.18 U	600 U
	9/27/2018	2 - 12	0.047 U	0.044 U	0.035 U	0.82 U	0.71 U	0.69 U	0.67 U	100 U
	8/21/2019	2 - 12	0.33 U	0.33 U	0.33 U	1.0 U	0.31 U	0.36 U	0.22 U	157 I
	11/21/2019	2 - 12	0.32 U	0.32 U	0.32 U	1.0 U	0.31 U	0.36 U	0.22 U	144 IJ
FSA1-MW0022R	11/9/2020	3 - 13	0.32 U	0.32 U	0.32 U	NA	0.31 U	0.36 U	0.22 U	140 U
	11/30/2021	3 - 13	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	100 U
	5/9/2022	3 - 13	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	100 U
	11/7/2023	3 - 13	0.032 U	0.039 U	NA	NA	NA	NA	0.67 U	NA
FSA1-MW0023	3/19/2018	2 - 12	0.20 U	0.20 U	0.25	NA	0.16 U	0.24 U	0.18 U	970
	9/27/2018	2 - 12	0.047 U	0.044 U	0.035 U	0.82 U	0.71 U	0.69 U	0.67 U	100 U
	8/21/2019	2 - 12	0.32 U	0.32 U	0.32 U	1.0 U	0.31 U	0.36 U	0.22 U	156 I
	11/21/2019	2 - 12	0.33 U	0.33 U	0.33 U	1.0 U	0.31 U	0.36 U	0.22 U	249 IJ
	5/27/2020	2 - 12	0.33 U	0.33 U	0.33 U	NA	0.31 U	0.36 U	0.22 U	565
	11/9/2020	2 - 12	0.33 U	0.33 U	0.33 U	NA	0.31 U	0.36 U	0.22 U	340
	11/30/2021	2 - 12	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	100 U
	5/9/2022	2 - 12	0.050 U	0.050 U	0.11	NA	NA	NA	0.67 U	100 U
11/7/2023	2 - 12	0.032 U	0.039 U	NA	NA	NA	NA	0.67 U	NA	

Table 6-2
Fuel Storage Area #1 Underground Storage Tank (Building 1044) - Long Term Monitoring (LTM)
Groundwater Sampling Analytical Results

Category			Polynuclear Aromatic Hydrocarbons (PAH) by Method SW8270 SIM			Volatile Organic Compounds (VOC) by Method 8260			FLO PRO	
Analyte			1-METHYL NAPHTHALENE	2-METHYL NAPHTHALENE	NAPHTHALENE	NAPHTHALENE	BENZENE	ETHYLBENZENE	ISOPROPYL BENZENE	TPH (C08-C40)
FDEP GCTLs (µg/L)			28	28	14	14	1	30	0.8	5,000
FDEP NADCs (µg/L)			280	280	140	140	100	300	8	50,000
Location ID	Sample Date	Screened Interval (ft bls)								
FSA1-MW0027	3/20/2018	14.5 - 24.5	0.091 I	0.044 U	0.035 U	0.82 U	0.71 U	0.69 U	2.7	100 U
	9/27/2018	14.5 - 24.5	0.047 U	0.044 U	0.15	0.82 U	0.71 U	0.69 U	1.5	100 U
	8/21/2019	14.5 - 24.5	0.33 U	0.33 U	0.33 U	1.0 U	0.31 U	0.36 U	1.8	1,570 V
	11/21/2019	14.5 - 24.5	0.32 U	0.32 U	0.32 U	1.0 U	0.31 U	0.36 U	1.2	1,990 J
	5/27/2020	14.5 - 24.5	0.33 U	0.33 U	0.33 U	NA	0.31 U	0.36 U	1.5	1,780
	11/9/2020	14.5 - 24.5	0.32 U	0.32 U	0.32 U	NA	0.31 U	0.36 U	1.4	3,040
	11/30/2021	14.5 - 24.5	0.050 U	0.050 U	0.24	NA	NA	NA	1.0	100 U
	5/9/2022	14.5 - 24.5	0.050 U	0.050 U	0.080 I	NA	NA	NA	0.67 U	100 U
11/7/2023	14.5 - 24.5	0.032 U	0.039 U	NA	NA	NA	NA	0.67 U	NA	
FSA1-MW0028	11/30/2021	15 - 25	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	100 U
	5/9/2022	15 - 25	0.050 U	0.050 U	0.050 U	NA	NA	NA	0.67 U	490 I
	11/7/2023	15 - 25	0.032 U	0.039 U	NA	NA	NA	NA	0.67 U	NA

Notes:

FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table 1 (2005)

FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code, Table V (2005)

ft bls = feet below land surface

FSA1 = Fuel Storage Area #1 Underground Storage Tank (Building 1044)

MW = monitoring well

NA = Not Analyzed

Results and screening criteria presented in µg/L (micrograms per liter)

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

Highlighted cell indicates an exceedance of FDEP NADCs

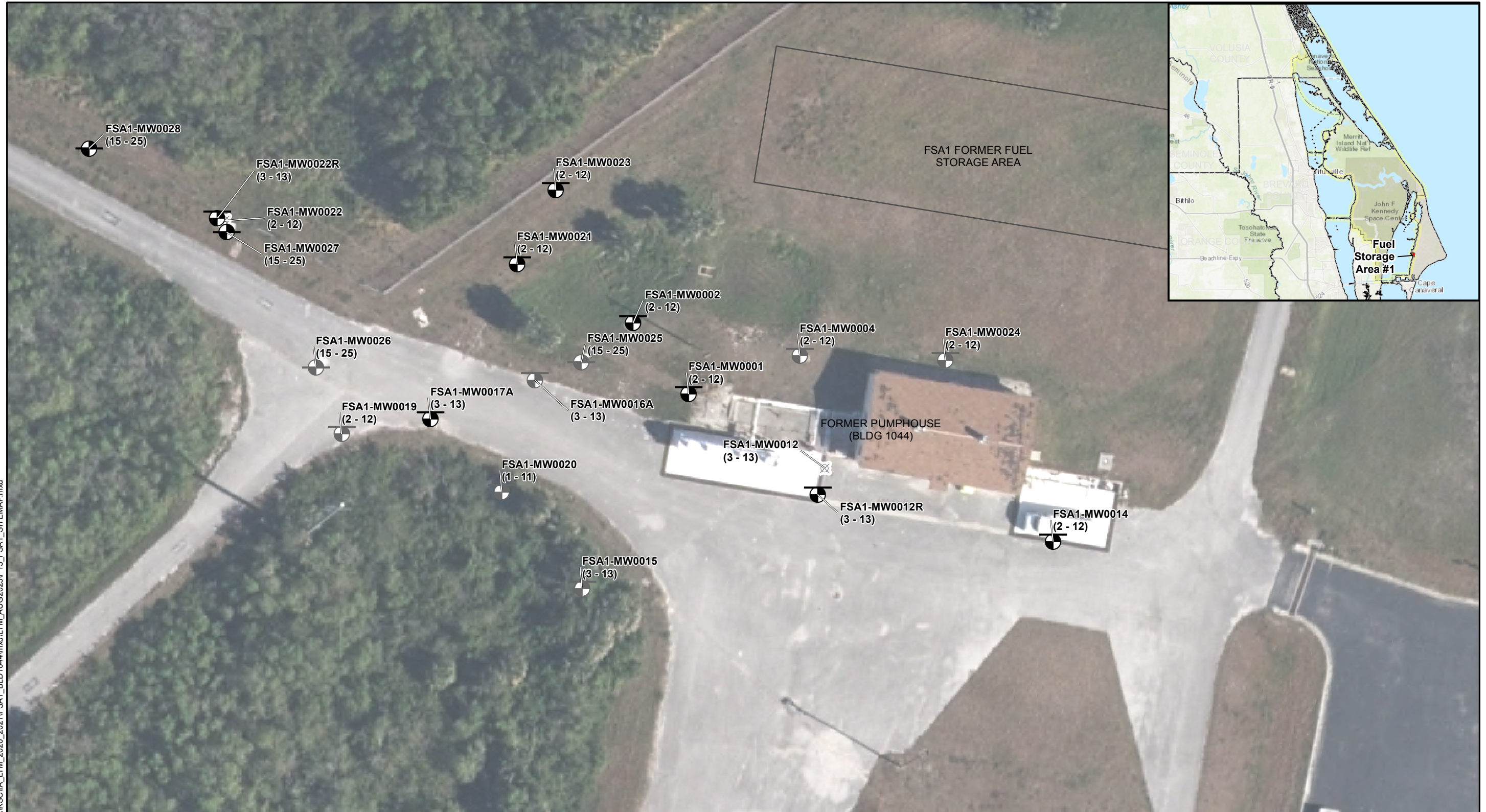
I = Analyte greater than or equal to the method detection limit, but less than the practical quantitation limit

J = Estimated value





U = Analyte not detected

V = Analyte found in associated method blank

The numeric value presented for non-detects is the sample-specific reporting detection limit

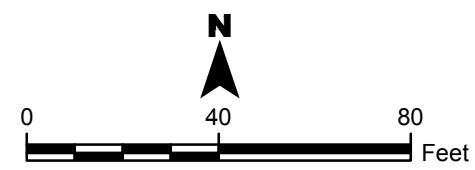


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- Legend**
-  Shallow Monitoring Well (1-13 feet bls)
 -  Intermediate Monitoring Well (15-25 feet bls)
 -  Abandoned Monitoring Well
 -  Building

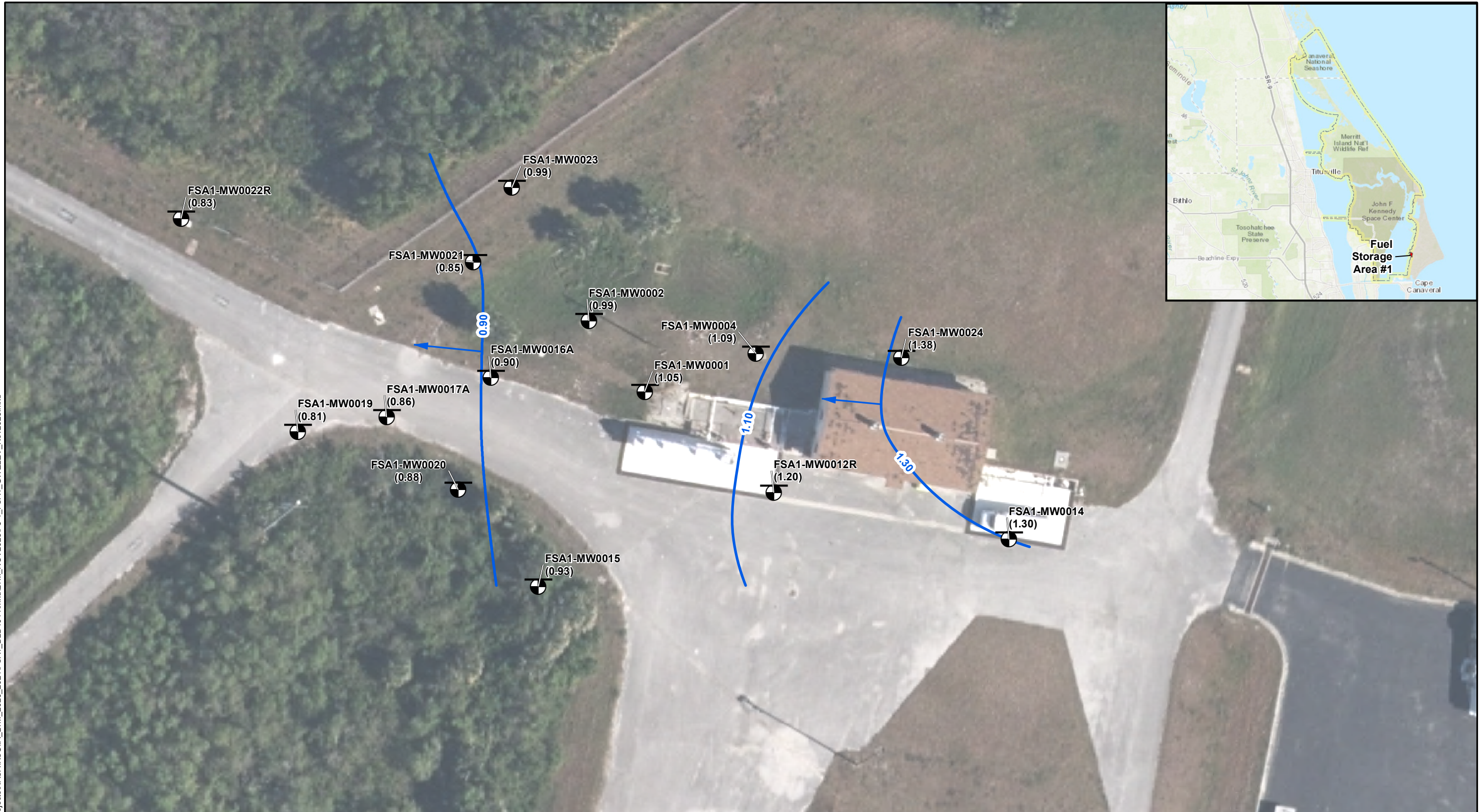
Notes:

- (2-12) = Monitoring well screen interval in feet below land surface
- Aerial Source: FDOT 2018
- bls = below land surface
- Gray icon = water level only
- PRL = Potential Release Location



**FIGURE 6-1
 Site Map**

2023 - Industrial Area Long Term Monitoring
 Fuel Storage Area #1 UST Building 1044 (FSA1)
 PRL 157
 NASA Kennedy Space Center, Florida



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- Legend**
- Shallow Monitoring Well (1-13 ft bls)
 - Groundwater Contour (NAVD88 ft)
 - Approximate Direction of Groundwater Flow
 - (0.81) Groundwater Elevation Contour (NAVD88 ft)

- Notes:**
- Vertical Datum is NAVD88 (US Foot)
 - Monitoring Wells Were Gauged on November 7, 2023
 - Groundwater Contour Interval = 0.20 ft
 - ft bls = feet below land surface
 - PRL = Potential Release Location
 - Aerial Source: FDOT 2018

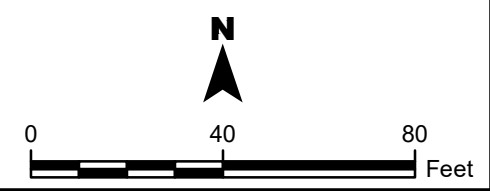
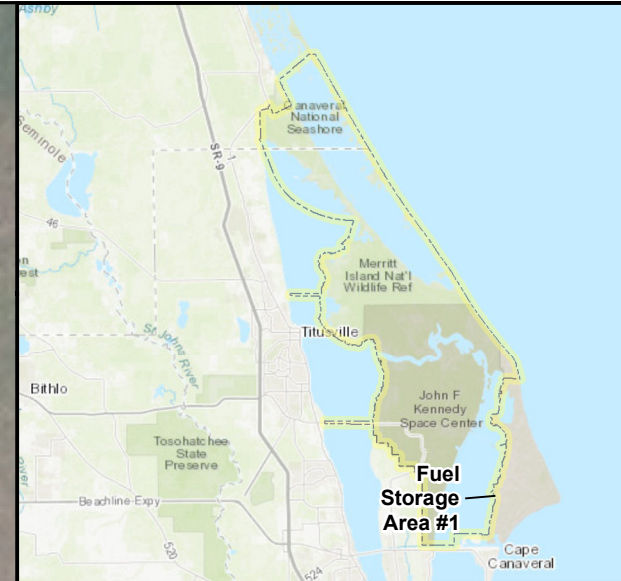


FIGURE 6-2
Shallow Zone Groundwater Elevation Map
November 2023
 2023 - Industrial Area Long Term Monitoring
 Fuel Storage Area #1 UST Building 1044 (FSA1)
 PRL 157
 NASA Kennedy Space Center, Florida



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- Legend**
- Intermediate Monitoring Well (15-25 ft bls)
 - Groundwater Contour (NAVD88 ft)
 - Approximate Direction of Groundwater Flow
 - (0.86) Groundwater Elevation Contour (NAVD88 ft)

- Notes:**
- Vertical Datum is NAVD88 (US Foot)
 - Monitoring Wells Were Gauged on November 7, 2023
 - Groundwater Contour Interval = 0.02 ft
 - ft bls = feet below land surface
 - PRL = Potential Release Location
 - Aerial image FDOT 2018

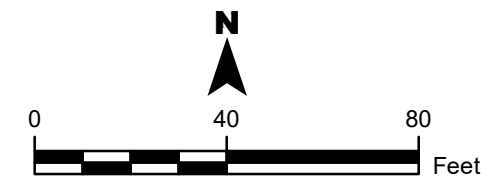
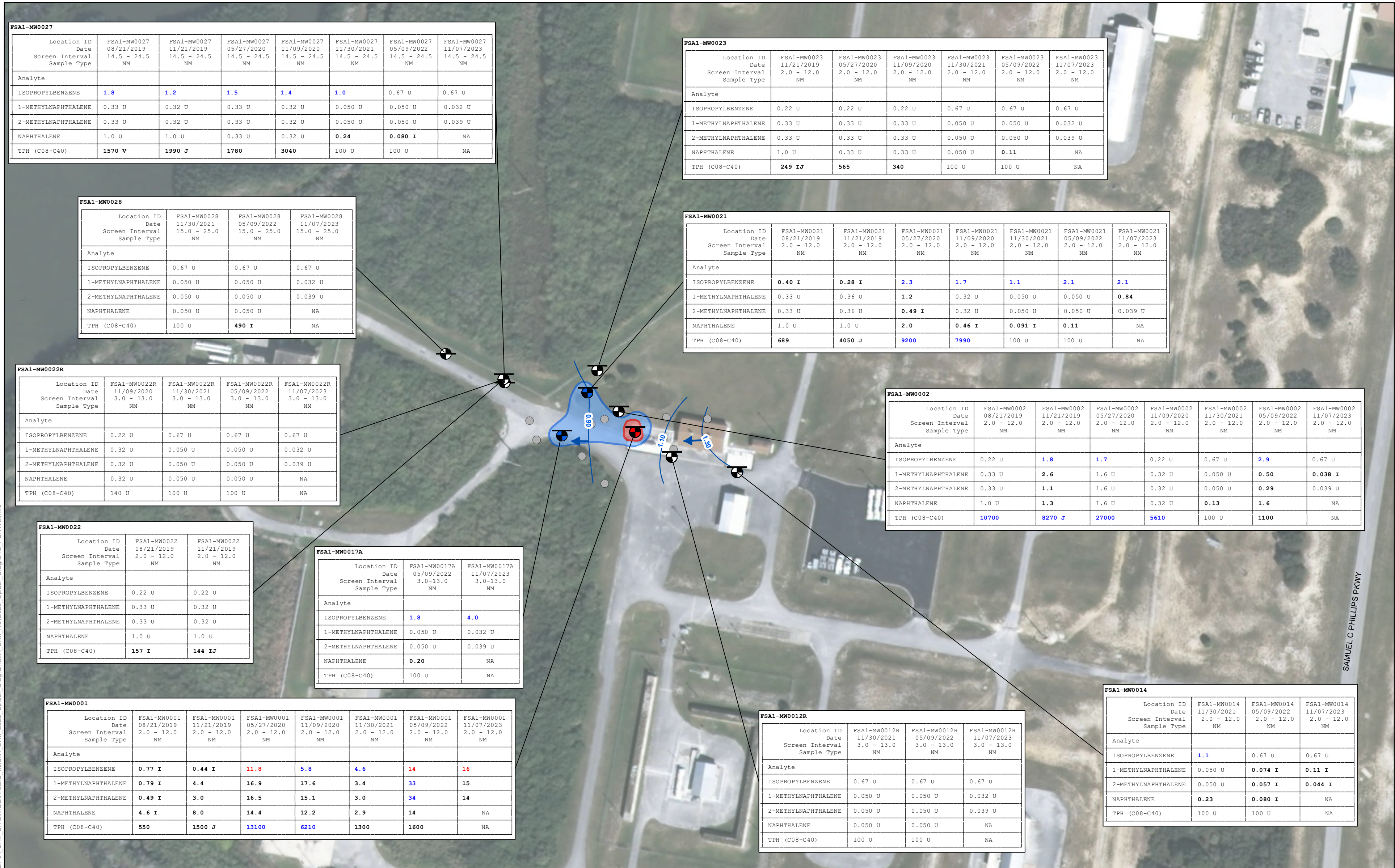


FIGURE 6-3
Intermediate Zone Groundwater Elevation Map
November 2023
 2023 - Industrial Area Long Term Monitoring
 Fuel Storage Area #1 UST Building 1044 (FSA1)
 PRL 157
 NASA Kennedy Space Center, Florida

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Legend

LTM Screen Interval, Monitoring Well Status, Exceedance Level

- Shallow LTM Well, Sample Results Exceed
- Shallow LTM Well, Sample Results Exceed
- Shallow LTM Well, Sample Results Below
- Intermediate LTM Well, Sample Results Below
- Non-LTM Well, No Sample Results
- Shallow Groundwater Elevation Contours - November
- Direction of Groundwater Flow
- Approximate Extent of Multiple Contaminants Greater Than GCTLs from Monitoring Well Sampling
- Approximate Extent of Isopropylbenzene Greater Than NADCs from Monitoring Well Sampling

- Notes:**
1. LTM = Long Term Monitoring
 2. MW = Monitoring Well
 3. NA = Not Analyzed
 4. NM = Normal Sample
 5. PRL = Potential Release Location
 6. SWMU = Solid Waste Management Unit
 7. ft bis = feet below land surface
 8. All results and screening criteria presented in µg/L.
 9. I = Result is greater than or equal to the Method Detection Limit (MDL) but less than the Practical Quantitation Limit (PQL).
 10. J = Estimated Concentration.
 11. U = Result was below the laboratory MDL.
 12. V = Analyte found in associated method blank.
 13. FDEP GCTLs = Florida Department of Environmental Protection Groundwater Cleanup Target Levels, Chapter 62-777, F.A.C.
 14. FDEP NADCs = Natural Attenuation Default Concentration, Chapter 62-777, F.A.C.
 15. Bolded results indicate the presence of an analyte at the specified concentration
 16. Blue font indicates an exceedance of FDEP GCTLs
 17. Red font indicates an exceedance of FDEP NADCs
 18. Aerial Source: FDOT 2018.
 19. Depth is presented in feet below land surface.
 20. Depth of monitoring well screen interval is presented in feet below land surface.

Analyte	GCTL	NADC
ISOPROPYLBENZENE	0.8	8
1-METHYL NAPHTHALENE	28	280
2-METHYL NAPHTHALENE	28	280
NAPHTHALENE	14	140
TPH (C08-C40)	5000	50000

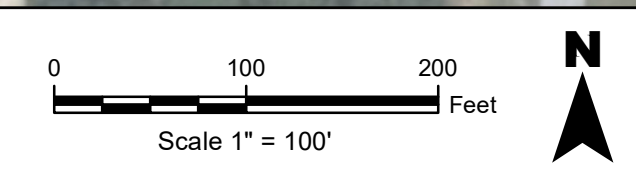


FIGURE 6-4
Groundwater Sampling Analytical Results

2023 - Industrial Area Long Term Monitoring
Fuel Storage Area #1 UST Building 1044 (FSA1)
PRL 157
NASA Kennedy Space Center, Florida

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7. CONCLUSIONS AND RECOMMENDATIONS

The facilities included in the NASA IA LTM Program have shown overall stable or decreasing trends in COC concentrations. Conclusions and recommendations from the 2023 IA LTM Program are summarized in the following sections. **Table 7-1** details the following recommendations and changes that were proposed for the IA LTM Program during the February 2024 KSCRT meeting. **Table 7-2** details the proposed IA LTM Program schedule for 2024-2025.

7.1 KENNEDY ATHLETIC, RECREATION, AND SOCIAL PARK I

Total lead concentrations at monitoring well KP1-MW0022 were below the GCTL during two consecutive annual sampling events in May 2022 and May 2023; therefore, groundwater LTM at KARS Park 1 LOC 9 is recommended to discontinue.

7.2 LAUNCH EQUIPMENT TEST FACILITY

VC concentrations continue to exceed the GCTL at monitoring well LETF-MW0001; therefore, the biennial sampling frequency is recommended to continue at monitoring wells LETF-MW0001 and LETF-PSB-MW0001 with 14 groundwater level measurements. The addition of TCE and cis-1,2-DCE analysis is recommended to check for additional dechlorination byproduct concentrations at the site. The next sampling event at LETF is scheduled for November 2025.

7.3 GENERAL SERVICES ADMINISTRATION SEIZED PROPERTY

VC concentrations exceeded the GCTL at three monitoring wells and the NADC at one monitoring well (GSSP-MW0020) in November 2023; however, concentrations of VC continue to show an overall decreasing trend. Naphthalene concentrations remain stable and above the GCTL at GSSP-MW0024R with no detections in monitoring wells upgradient or downgradient.

The list of monitoring wells in which MNA parameters are sampled during the expanded sampling events is recommended to be adjusted to focus on the monitoring wells with current VC exceedances to evaluate reductive dechlorination conditions within the plume area. Monitoring wells GSSP-MW0019, GSSP-MW0020, and GSSP-MW0053 are recommended to include methane, ethane, and ethene; Dehalococoides; and total organic carbon analyses during the five-year expanded sampling events.

Based on a review of historical data following the February 2024 KSCRT meeting, monitoring wells GSSP-MW0050 (5-15 ft bls), GSSP-MW0051 (15-25 ft bls), and GSSP-MW0052 (25-35 ft bls) were found to be located upgradient of monitoring wells GSSP-MW0019 and GSSP-MW0020 and were last sampled in 2009, during the RFI. VC concentrations were reported equal to the GCTL at monitoring well GSSP-MW0050 and exceeding the NADC at monitoring wells

GSSP-MW0051 and GSSP-MW0052; however, these three monitoring wells were not included in the original LTM plan. VC concentrations have reduced to below the GCTL around the source area; therefore, these monitoring wells are recommended to be added to the LTM Program with annual water level measurements and VC analysis during the expanded sampling events to serve as an additional upgradient point of compliance.

Monitoring wells GSSP-MW0028 (5-15 ft bls) and GSSP-MW0054 (25-35 ft bls) are located downgradient of monitoring wells GSSP-MW0019 and GSSP-MW0020 and are recommended to be added to the expanded sampling events for VC analysis. Monitoring well GSSP-MW0028 is also recommended to be added to the list of annual groundwater level measurements. Monitoring well GSSP-MW0028 had a VC exceedance of 2.0 µg/L the last time it was sampled in 2009. Monitoring well GSSP-MW0054 had three non-detectable VC analyses before being removed from the sampling program in 2016; however, this location has the same screen interval depth as upgradient monitoring well GSSP-MW0020, and the VC concentration is recommended to be analyzed again to confirm the downgradient VC concentration in the intermediate aquifer zone.

The annual LTM sampling frequency is recommended to continue with an expanded sampling event every five years. The next sampling event, scheduled for November 2024, will be the five-year expanded sampling event and will include water level measurements at 37 monitoring wells and groundwater samples from 28 monitoring wells.

7.4 SPACE STATION PROCESSING FACILITY

Total ammonia concentrations remain stable and continue to exceed the GCTL at monitoring well SSPF-MW0004 and two times the KSC average background concentration at monitoring wells SSPF-MW0006, SSPF-MW0014, and SSPF-MW0016. However, the calculated un-ionized ammonia concentrations are below the alternative GCTL except at monitoring well SSPF-MW0019. The total ammonia concentration at SSPF-MW0019 was below the GCTL when it was sampled in 2009, and therefore the monitoring well was not carried forward in the LTM program. The pH in monitoring well SSPF-MW0019 was measured higher than the site average in 2009 due to possible grout intrusion, causing a high calculated un-ionized ammonia result.

Groundwater LTM at SSPF is recommended to discontinue. Land use controls are recommended to remain in place as the facility continues to use ammonia in its regular operations.

7.5 FUEL STORAGE AREA #1 UNDERGROUND STORAGE TANK (BUILDING 1044)

Isopropylbenzene concentrations remain above GCTL at three monitoring wells downgradient of the former Building 1044 area, and monitoring well FSA1-MW0001 continues to exceed the NADC. 1- and 2-Methylnaphthalene concentrations were below GCTLs in 2023.

Annual LTM sampling is recommended to continue during alternating wet and dry seasons. Monitoring wells FSA1-MW0012R, FSA1-MW0014, and FSA1-MW0028 are recommended to be removed from the LTM Program for collection of groundwater samples based on concentrations below GCTLs for the past two or more consecutive sampling events. Monitoring wells FSA1-MW0012R and FSA1-MW0014 are located upgradient of the source area with a historically consistent groundwater flow pattern at the site. Monitoring well FSA1-MW0028 is located downgradient and has the same screen interval depth as monitoring well FSA1-MW0027, which remains in the LTM Program to monitor the intermediate zone downgradient of the former source area. Monitoring well FSA1-MW0019 is recommended to be added to the sampling list as a downgradient monitoring well to FSA1-MW0017A. The next sampling event is recommended to include 18 water level measurements and eight groundwater samples analyzed for isopropylbenzene and select PAHs (1-methylnaphthalene and 2-methylnaphthalene). The next sampling event at FSA1 is scheduled for May 2024.

**Table 7-1
Industrial Area - Long Term Monitoring
IA LTM Recommendations**

Site	Recommendations for the NASA KSC IA LTM	Sampling Frequency	Next Sampling Event(s)
KP1 LOC 9 (SWMU 084)	Total lead concentrations at monitoring well KP1-MW0022 were below the GCTL during two consecutive sampling events in May 2022 and May 2023. Therefore, groundwater LTM sampling at KARS Park 1 LOC 9 is recommended to discontinue. The LUC at the site is to remain until the completion of LTM at LOC 7, completing the Statement of Basis objectives for KARS Park 1.	5-year	None
LETF (SWMU 091)	LTM is recommended to continue at monitoring wells LETF-MW0001 and downgradient LETF-PSB-MW0001I. TCE and cis-1,2-DCE are recommended to be added to the site COCs to confirm historical concentrations at LETF-MW0001 remain below GCTLs. Groundwater levels should continue to be measured at 14 monitoring wells.	Biennial Alternating Wet/Dry	November 2025
GSSP (SWMU 095)	<p>The annual LTM sampling frequency is recommended to continue with an expanded sampling event every five years. Monitoring well GSSP-MW0028 is recommended to be added to the list of groundwater elevations during annual events. Monitoring wells GSSP-MW0028, GSSP-MW0050, GSSP-MW0051, GSSP-MW0053, and GSSP-MW0054 are recommended to be included for VC analysis during the expanded sampling events.</p> <p>MNA parameter collection is recommended to be adjusted to focus around the current VC exceedance area (GSSP-MW0019, GSSP-MW0020, and GSSP-MW0053) during the expanded sampling events.</p> <p>The next sampling event is the expanded event and will include water level measurements at 37 monitoring wells and groundwater samples from 28 monitoring wells.</p>	Annual Wet Season	November 2024 (expanded event) and November 2025
SSPF (SWMU 098)	Groundwater LTM at SSPF is recommended to discontinue since the un-ionized ammonia concentrations (except SSPF-MW0019) are below the alternative GCTL, and the total ammonia concentrations remain stable and were below the GCTL at SSPF-MW0019. The LUC is recommended to be removed, completing the 2010 Statement of Basis objectives.	Biennial Alternating Wet/Dry	None

**Table 7-1
Industrial Area - Long Term Monitoring
IA LTM Recommendations**

Site	Recommendations for the NASA KSC IA LTM	Sampling Frequency	Next Sampling Event(s)
<p align="center">FSA1 (PRL 157)</p>	<p>COC concentrations at monitoring wells FSA1-MW0012R, FSA1-MW0014, and FSA1-MW0028 have been below GCTLs for two or more consecutive sampling events; therefore, these monitoring wells are recommended to be removed from the sampling schedule. Monitoring well FSA1-MW0019 is recommended to be added to the sampling schedule as a downgradient well to FSA1-MW0017A.</p> <p>Annual LTM is recommended to continue with eight monitoring wells analyzed for isopropylbenzene and select PAHs (1-methylnaphthalene and 2-methylnaphthalene), and water level measurements at 18 monitoring wells.</p>	<p align="center">Annual Alternating Wet/Dry</p>	<p align="center">May 2024 and November 2025</p>

Notes:

- COC = contaminant of concern
- DCE = dichloroethene
- FSA1 = Fuel Storage Area #1 Underground Storage Tank (Building 1044)
- GCTL = Groundwater Cleanup Target Level
- GSSP = General Services Administration Seized Property
- IA = Industrial Area
- KP1 = Kennedy, Athletic, Recreation, and Social Park 1
- KSC = Kennedy Space Center
- LETF = Launch Equipment Test Facility
- LOC = location of concern
- LTM = long-term monitoring
- LUC = Land Use Control
- MNA = monitored natural attenuation
- MW = monitoring well
- NASA = National Aeronautics and Space Administration
- PAH = polynuclear aromatic hydrocarbon
- PRL = Potential Release Location
- SSPF = Space Station Processing Facility
- SWMU = Solid Waste Management Unit
- TCE = trichloroethene
- VC = vinyl chloride

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Industrial Area
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July 2024

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**Table 7-2
Industrial Area - Long Term Monitoring
2024/2025 Program Monitoring Schedule**

Site	Monitoring Wells for Groundwater Level Measurements		Monitoring Wells for Groundwater Samples	Sample Analysis	May 2024	November 2024	May 2025	November 2025	Water Levels	Wells Sampled	Sample Frequency
RRLF (SWMU 003)	MW0012	MW0037	MW0033	VC Only by Method 8260B		X			16	5	Biennial Alternating Wet/Dry
	MW0015	MW0038S	MW0038I								
	MW0029	MW0038I	MW0039I								
	MW0030	MW0039S	MW0040I								
	MW0031	MW0039I	MW0043*								
	MW0033	MW0040I									
	MW0034	MW0042I									
	MW0036	MW0043*									
M505 (SWMU 039)	MW0003S	MW0030	MW0013	Select VOCs by Method 8260B		X			35	9	Biennial Alternating Wet/Dry
	MW0007S	MW0031	MW0029								
	MW0007I	MW0032	MW0032								
	MW0008S	MW0033	MW0033								
	MW0009S	MW0035	MW0039								
	MW0009I	MW0039	MW0049								
	MW0012I	MW0042	MW0051								
	MW0013	MW0045	MW0055								
	MW0014	MW0046	MW0059								
	MW0017	MW0049									
	MW0020	MW0050									
	MW0022	MW0051									
	MW0024	MW0054									
	MW0025	MW0055									
	MW0026	MW0057									
MW0027	MW0058										
MW0028	MW0059										
MW0029											
O&C (SWMU 076)	MW0003I	MW0006I	MW0005I	VC Only by Method 8260B		X			5	3	Biennial Alternating Wet/Dry
	MW0004I	MW0007I	MW0006I								
	MW0005I		MW0007I								
VPF (SWMU 077)	IW0001S	IW0015I	IW0008I	Select VOCs by Method 8260B		X			35	9	Biennial Alternating Wet/Dry
	IW0002I	IW0016I	IW0008D								
	IW0002S	IW0017I	IW0010I								
	IW0003I	IW0018I	IW0018I								
	IW0003S	MW0020	MW0021								
	IW0004I	MW0021	MW0022								
	IW0004S	MW0022	MW0025								
	IW0005S	MW0023	MW0027								
	IW0006S	MW0024	MW0032*								
	IW0007I	MW0025									
	IW0008D	MW0026									
	IW0008I	MW0027									
	IW0009I	MW0028									
	IW0010I	MW0029									
	IW0011I	MW0030									
	IW0012I	MW0031									
	IW0013I	MW0032*									
IW0014I											

**Table 7-2
Industrial Area - Long Term Monitoring
2024/2025 Program Monitoring Schedule**

Site	Monitoring Wells for Groundwater Level Measurements		Monitoring Wells for Groundwater Samples		Sample Analysis	May 2024	November 2024	May 2025	November 2025	Water Levels	Wells Sampled	Sample Frequency
EHF (SWMU 079)	MW0001	MW0006	MW0001		VC Only by Method 8260B		X			7	4	Biennial Wet Season
	MW0003	MW0007	MW0004									
	MW0004	MW0009*	MW0005									
	MW0005		MW0009*									
KARS Park 1 LOC7 (SWMU 084)	MW0011	MW0031	MW0013		Arsenic by Method 6020A				X	5	2	5-Year
	MW0012	MW0032	MW0032									
	MW0013											
EDL (SWMU 085)	MW0004	MW0007	MW0004		VC Only by Method 8260B		X			4	2	Biennial Wet Season
	MW0005		MW0006R									
	MW006R											
LETF (SWMU 091)	MW0001	MW0008	MW0001		Select VOCs by Method 8260B				X	14	2	Biennial Alternating Wet/Dry
	MW0002	MW0009	PSB-MW0001I									
	MW0003	MW0010										
	MW0004	MW0011										
	MW0005	PSB-MW0001I										
	MW0006	PSB-MW0002I										
	MW0007	PSB-MW0003I										
MOBIL (SWMU 093)	MW0005	MW0019	MW0006		Select VOCs (Method 8260B) and Select PAHs (Method 8270D)		X			9	6	Biennial Alternating Wet/Dry
	MW0006	MW0023										
	MW0007	MW0024										
	MW0014		MW0005	MW0023	Select VOCs by Method 8260B							
	MW0015		MW0018	MW0024								
MW0018		MW0019										
GSSP (SWMU 095)	MW0006	MW0049	MW0024R		VC Only (Method 8260B) and Naphthalene (Method 8270D)		X		X	37	14	Annual Wet Season
	MW0007	MW0050	MW0035									
	MW0008	MW0051	MW0053									
	MW0009	MW0052	MW0013	MW0059	VC Only by Method 8260B							
	MW0013	MW0053	MW0019	MW0060								
	MW0014	MW0054	MW0020	MW0061								
	MW0019	MW0055	MW0034	MW0062								
	MW0020	MW0058	MW0036	MW0063								
	MW0021	MW0059	MW0044R									
	MW0022	MW0060	MW0014	MW0039								
	MW0023	MW0061	MW0021	MW0042	VC Only by Method 8260B (Expanded Event)							
	MW0024R	MW0062	MW0022	MW0043R								
	MW0026	MW0063	MW0023	MW0050								
	MW0027		MW0026	MW0051								
	MW0028		MW0027	MW0052								
	MW0034		MW0028	MW0054								
	MW0035		MW0019		MEE by Method RSK 175 (Expanded Event)							
	MW0036		MW0020									
	MW0039		MW0053									
	MW0042		MW0019	MW0053	Dhc Analysis (Expanded Event)							
	MW0043R		MW0020									
	MW0044R		MW0019		Total Organic Carbon by Method SM5310 (Expanded Event)							
	MW0045		MW0020									
MW0047		MW0053										

**Table 7-2
Industrial Area - Long Term Monitoring
2024/2025 Program Monitoring Schedule**

Site	Monitoring Wells for Groundwater Level Measurements		Monitoring Wells for Groundwater Samples	Sample Analysis	May 2024	November 2024	May 2025	November 2025	Water Levels	Wells Sampled	Sample Frequency
FSA1 (PRL 157)	MW0001	MW0020	MW0001	Isopropylbenzene (Method 8260B) and Select PAHs (Method 8270D)	X				18	8	Annual Alternating Wet/Dry
	MW0002	MW0021	MW0002								
	MW0004	MW0022R	MW0017A								
	MW0012R	MW0023	MW0019								
	MW0014	MW0024	MW0021								
	MW0015	MW0025	MW0022R								
	MW0016A	MW0026	MW0023								
	MW0017A	MW0027	MW0027								
	MW0019	MW0028									

Note:

- * indicates newly installed monitoring well
- Dhc = dehalococoides
- EDL = Engineering Development Laboratory
- EHF = Environmental Health Facility
- FSA1 = Fuel Storage Area #1 Underground Storage Tank (Building 1044)
- GSSP = General Services Administration Seized Property
- KP1 = Kennedy, Athletic, Recreation, and Social Park 1
- LETF = Launch Equipment Test Facility
- M505 = Building M7-0505 Treatment Tank Area
- MEE = methane, ethane, and ethene
- MOBIL = Mobil Service Station
- MW = monitoring well
- O&C = Operations and Checkout Building
- PAH = polynuclear aromatic hydrocarbon
- PRL = Potential Release Location
- RRLF = Ransom Road Landfill
- SWMU = Solid Waste Management Unit
- VC = vinyl chloride
- VOC = volatile organic compound
- VPF = Vertical Processing Facility

	May 2024	November 2024	May 2025	November 2025
Total water levels to be measured	18	148	0	74
Total wells to be sampled	8	66	0	26

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Long-Term Groundwater Monitoring Report
Industrial Area
Revision: 0
July 2024

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APPENDIX A

KENNEDY SPACE CENTER REMEDIATION TEAM MEETING MINUTES

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Revision 1 Meeting Minutes for the KSCRT Meeting - April 5th, 2023

Attendees:

- | | |
|-------------------------------|---------------------------------|
| 1. Evan Miller/FDEP | 11. Sarah Damphousse/Tetra Tech |
| 2. Jason French/FDEP | 12. Jennifer Gootee/AECOM |
| 3. Ryan O’Meara/NASA | 13. Chad Lee/AECOM |
| 4. Deda Johansen/NASA | 14. Chris Marshall/AECOM |
| 5. Natasha Darre/NASA | 15. Greg Kusel/AECOM |
| 6. Anne Chrest/NASA | 16. Richard Smith/HGL |
| 7. Michelle Moore/NEMCON | 17. Jason Bublitz/HGL |
| 8. Mark Jonnet/Tetra Tech | 18. Robert Lynch/HGL |
| 9. Mark Speranza/Tetra Tech | |
| 10. Andrew Walters/Tetra Tech | |

2304-M01 Michelle Moore/NEMCON

Meeting Minutes and Miscellaneous Items

Objective:

Test team consensus on February 2023 KSCRT meeting minutes and review open action items.

Discussion:

Team consensus was reached that Revision 1 of the February 2023 KSCRT meeting minutes and action items are final. Team members are aware that meeting minutes and decision/action items may become public as part of a report at a later date **(2304-D01)**.

Open action items were reviewed and the following were closed out:

C-5 Electrical Substation (SWMU #066) Groundwater Monitoring Report and Long-Term Monitoring Work Plan:

The Florida Department of Environmental Protection (FDEP) requested the team construct an east/west cross-section of the plume to show vertical delineation of the site and put data points on the figure. A figure like this already exists and was developed during the site characterization. NASA will send this figure to FDEP.

The figure was included in the C-5 Electrical Substation Groundwater Monitoring Report that was sent to FDEP on January 23, 2023 **(2210-A02)**.

completed for the site and identified four LOCs. Confirmation sampling (CS) results were presented in May 2022 and Team consensus was obtained for no further action for soil and groundwater at LOCs 3 and LOC 4, perform an IM for arsenic-impacted soil exceeding the industrial Soil Cleanup Target Levels (iSCTL), develop land use controls for arsenic and iron impacts above the residential SCTL at LOC 1 and LOC 2, and install one monitoring well at LOC 1 following soil IM activities at LOC 1.

Based upon CS results, it is recommended that arsenic-impacted soil exceeding the FDEP (iSCTL) from 0 to 0.5 feet below land surface (810 square feet) at LOC 1 be excavated and disposed of off-site at an approved landfill.

Team consensus was reached on the Interim Measure excavation boundary (bounded by sample locations below iSCTL: SB0026, SB0029, SB0018, SB0020, SB0031, SB0030, SB0048, SB0047, SB0046, SB0045, SB0043, SB0003, SB0042) **(2304-D12)**.

FDEP inquired where the groundwater sample was going to be taken from; where was the highest soil contamination detected at on the site? HGL responded that the highest detection was at SB0001. FDEP stated that groundwater sampling anywhere in that vicinity would be acceptable.

Results: Decision Items 2304-D12

2304-M06 Greg Kusel/AECOM

**Hypergol Maintenance Facility (HMF) South (SWMU #070)
Groundwater No Further Action (NFA) Request, April 2023**

Objective: The HMF South area is soon to be re-developed. The purpose of this briefing is to summarize the site's remediation history, present the recent efforts to verify recent groundwater flow direction, and seek consensus on the path forward.

Discussion:

The 1999 Confirmation Sampling Report for HMF South identified polychlorinated biphenyls (PCBs) > Industrial Soil Cleanup Targets Levels (SCTLs); and aluminum, trichlorofluoromethane (TCFM) and other volatile organic compounds (VOCs) > Groundwater Cleanup Target Levels (GCTLs). The Resource Conservation and

Recovery Act (RCRA) Facility Investigation (RFI) conducted from 1999 through 2002 delineated soil and groundwater for identified contaminants of concern (COCs) and recommended an interim measure (IM) for soil. A Corrective Measures Study (CMS) recommended an Interim Measure (IM) for soil removal, which was completed in December 2003. An additional CMS for groundwater in February 2004 recommended monitored natural attenuation (MNA) for aluminum and vinyl chloride (VC), and utilization of air sparging (AS) to treat TCFM; documented in August 2004 Statement of Basis (SB).

The AS system was installed in September 2005 and expanded in 2007 and 2012. The system operated through March 2013, and again for five months in 2014. In September 2006, No Further Action (NFA) for aluminum in groundwater was attained. In October 2010, NFA was granted for VC in groundwater (Tetra Tech, October 2011 ADP). The 2016 sampling frequency changed to biennially for TCFM, following ten years of data consistently exceeding GCTLs in one well (HMF-NLP-IW0004I).

Two consecutive sampling events were below GCTLs at IW0004I (2020 and 2021). Continued decreasing TCFM concentrations were observed following air sparge (AS) system shut-down. MW0006IR was picked up in 2021 based on its downgradient location.

In November 2022, groundwater elevation measurements were collected from 10 monitoring wells (MWs). Relative top of casing (TOC) survey was completed at 10 MWs.

Updated 2021 and 2022 groundwater flow maps confirmed groundwater flow is consistent with the historical flow direction, so MW0006IR is representative of downgradient conditions. TCFM concentrations were less than GCTL for two consecutive sampling events in November 2020 and September 2021. Recommend discontinuing monitored natural attenuation (MNA) of groundwater and abandoning site monitoring wells.

NASA added that they want to get the wells abandoned by July 2023 for support of an upcoming construction project. FDEP inquired if TCFM was the only contaminant in these wells? NASA confirmed that was correct; other site COCs were sampled for and obtained NFA consensus previously. FDEP inquired if there were only the

two wells sampled. NASA noted that was true for the most recent sampling events. Other wells were previously dropped from the monitoring program (IW003I and IW005I) since results were below the GCTL for years following the air sparge system remedy. NASA added that, given the impending construction, if a concern arises after the wells are abandoned, they are willing to go back and install post-construction. FDEP inquired if the pond there was clay-lined? NASA stated they did not believe it was clay-lined; it likely has a sandy bottom.

Team consensus was reached for No Further Action for groundwater at HMF South and to abandon all site monitoring wells (**2304-D13**).

Results: Decision Items 2304-D13

2304-M07 KSCRT

Miscellaneous Discussion

AECOM

1. Industrial Area LTM (Chris Marshall) (45 min)
2. Q6 Interim Measure (Chad Lee) (30 min)
3. South Repeater ADP and Potential pilot study IMWP (Megan Garcia) (1 hour)
4. VAB LTM (Chad Lee) (1 hour)

HGL

1. CRHEA RAE (Megan or Cindy) (1 hour total)
2. GSRV West SWMU #036 - IMWP

Tetra Tech

1. CCB SWMU #030 - Annual Performance Monitoring Update (Andrew Walters) (45 min)

2023 Meeting Dates (continues to be hybrid option in 2023)

June 8th and 9th

August 3rd and 4th

October 5th and 6th

November 30th and December 1st

April 2023 Decision Items Rev 1		Decision
Decision No.	Minutes Reference	
2304-D01	2304-M01	Meeting Minutes and Miscellaneous Items: Test team consensus was reached that Revision 1 of the February 2023 KSCRT meeting minutes and action items are final. Team members are aware that meeting minutes and decision/action items may become public as part of a report at a later date.
2304-D02	2304-M02	CRHEA Groundwater Monitoring Update: Team consensus was reached continue annual sampling as follows: <ul style="list-style-type: none"> •Sample 15 wells for VOCs. That includes Hot Spot 1: MW0025, MW0027, MW0029, MW0047, MW0048, and MW0058; Hot Spot 2: MW0031, MW0032, and MW0042; Northern Area: MW0017I, MW0019I, and MW0034; and down gradient: MW0035, MW0039, and MW0041. •Sample 4 wells for 1,4-dioxane within HS1: MW0025 and downgradient: MW0035, MW0039, and MW0041. •Sample 3 wells for TRPH within HS1 at MW0044, MW0047, and MW0056. •Sample 1 well for sodium within HS1 at MW0047 and eliminate MW0044 since last 2 consecutive events were less than GCTL. •Sample 6 wells for TDS (biennial) within HS1 at MW0025, MW0043, MW0044, MW0056, MW0057, and MW0058. •Collect depth to water measurements from 48 site-wide monitoring wells. Abandon monitoring well IW0004S if obstruction at 2 to 3 ft. btoc cannot be repaired, and abandon IW0014I and IW0015I due to obstructions at 17.2 and 5 ft. btoc, respectively. •Make one final attempt to locate IW0016I, IW0018I, and IW0020I. Determine viability and properly abandon any wells that are located but cannot be repaired. •Generate Mann-Kendall statistics for all applicable wells (that meet the criteria for using Mann-Kendall)
2304-D03	2304-M02	CRHEA Groundwater Monitoring Update: Team consensus was reached to sample 10 monitoring wells for PFAS: IW0001S, IW0002S, IW0004I, IW0009S, IW0013S, IW0017I, IW0019I, MW0024, MW0025, and MW0030
2304-D04	2304-M02	CRHEA Groundwater Monitoring Update: Team consensus was reached to conduct sub slab soil gas sampling event for CVOCs in June and December 2023, to evaluate if there are changes in sub slab soil gas in the four vapor probes due to previous interim measure activities or plume movement.
2304-D05	2304-M03	GSA Reclamation Yard (GSRY) 2022 Groundwater Monitoring Results: Team consensus was reached to conduct annual water level measurements at 55 monitoring wells in 2023 (Slide 22).
2304-D06	2304-M03	GSA Reclamation Yard (GSRY) 2022 Groundwater Monitoring Results: Test consensus to discontinue monitoring for VOCs at 18 monitoring wells and one surface water location due to at least two consecutive events in which site VOC concentrations were below GCTLs.
2304-D07	2304-M03	GSA Reclamation Yard (GSRY) 2022 Groundwater Monitoring Results: Test consensus to discontinue monitoring for polychlorinated biphenyls (PCBs) at 20 monitoring wells and one surface water location due to at least two consecutive events in which PCB concentrations were below GCTLs.
2304-D08	2304-M03	GSA Reclamation Yard (GSRY) 2022 Groundwater Monitoring Results: Test consensus to perform annual monitoring at 12 monitoring wells; samples from four to be analyzed for VOCs and PCBs, one for PCBs, and seven for VOCs.
2304-D09	2304-M03	GSA Reclamation Yard (GSRY) 2022 Groundwater Monitoring Results: Test consensus to continue annual UIC monitoring at GSRY-MW0049 for sulfate, iron, manganese, and sodium, and at GSRY-MW0050, and GSRY-MW0066 for sulfate, iron, sodium, and TDS.
2304-D10	2304-M03	GSA Reclamation Yard (GSRY) 2022 Groundwater Monitoring Results: Team consensus was reached to perform annual UIC groundwater monitoring at GSRY-MW0067 for iron, and at GSRY-MW0071 and GSRY-MW0073 for iron and TDS.
2304-D11	2304-M04	CCB SWMU #089 - MW21 Area Groundwater IMWP: Team consensus was reached on the Interim Measure Work Plan (IMWP) design for in situ reductive dechlorination injection treatment of the high concentration plume (HCP)/ Hot Spot (HS) / Source Zone (SZ) at the MW21 Area and to proceed with the develop of an Implementation Work Plan to plan and facilitate the Interim Measure.
2304-D12	2304-M05	Corrosion Atmospheric Exposure Facility (PRL 239) Interim Measure (IM) Work Plan: Team consensus was reached on the Interim Measure excavation boundary (bounded by sample locations below iSCTL: SB0026, SB0029, SB0018, SB0020, SB0031, SB0030, SB0048, SB0047, SB0046, SB0045, SB0043, SB0003, SB0042).
2304-D13	2304-M06	Hypergol Maintenance Facility (HMF) South (SWMU #070) Groundwater No Further Action (NFA) Request: Team consensus was reached for No Further Action for groundwater at HMF South and to abandon all site monitoring wells.

Revision 2 Meeting Minutes for June 28th & 29th, 2023

Attendees:

1. Evan Miller/FDEP
2. Jason French/FDEP
3. TJ Touran/FDEP
4. Ryan O’Meara/NASA
5. Deda Johansen/NASA
6. Natasha Darre/NASA
7. Anne Chrest/NASA
8. Michelle Moore/NEMCON
9. Mark Jonnet/Tetra Tech
10. Mark Speranza/Tetra Tech
11. Andrew Walters/Tetra Tech
12. Sarah Dampousse/Tetra Tech
13. Chris Pike/Tetra Tech
14. Scott Anderson/Tetra Tech
15. Jennifer Gootee/AECOM
16. Chris Marshall/AECOM
17. Chad Lee/AECOM
18. Linnea King Clark/AECOM
19. Megan Garcia/AECOM
20. Jennifer Buel/AECOM
21. Richard Smith/HGL
22. Howard Fowler/HGL
23. Robert Lynch/HGL
24. Bruce Moore/HGL

2306-M01 Michelle Moore/NEMCON

Meeting Minutes and Miscellaneous Items

Objective:

Reviewed the outstanding consensus items. Obtained consensus that Revision 1 of the April 2023 KSCRT meeting minutes and action items are final. Team members are aware and do not object that meeting minutes and decision/action items may become public as part of a report at a later date **(2306-D01)**.

Discussion:

Open action items were reviewed and the following were closed out:

Launch Complex 39A (SWMU 008) and Launch Complex 39B (SWMU 009) Performance Monitoring, February 2023: Action item for NASA to provide a list of wells that will be sampled for PFAS at LC39A to FDEP prior to conducting the sampling.

The list of wells were provided to FDEP to close this action item out **(2302-A01)**.

FDEP noted that it is proposed to replace a well with a 5ft screen with a 10ft screen. DPT results were clean all the way down to 50ft.

Is there a clay layer (retarding unit) across the Fluid Servicing Road area? Tetra Tech stated that for the most part this material is present throughout the site and acts like a retarding unit, but noted that some VC has made its way through.

The Team reached consensus to transition from PM to LTM with next reporting period (January 2023 – December 2023) as Year 1 of LTM **(2306-D05)**.

The Team reached consensus to continue sampling 25 wells plus MW62 and MW64 annually in December 2023 and 23 wells biennially in December 2024 to monitor VOC contaminant trends; well IDs and sampling frequency are shown on Slide 18 of the presentation. Sampling results will be presented to the KSCRT prior to submittal of 2023 Annual LTM Report **(2306-D06)**.

Results: Decision Items 2306-D05, D06

2306-M07 Chris Marshall/AECOM

Industrial Area (IA) Long-Term Monitoring (LTM) Update, June 2023

Objective: The purpose of this advance data package (ADP) is to present activities and data associated with eleven IA LTM sites: Ransom Road Landfill (RRLF) (Solid Waste Management Unit [SWMU] 003), Building M7-0505 Treatment Tank Area (M505) (SWMU 039), Operations and Checkout Building (O&C) (SWMU 076), Vertical Processing Facility (VPF) (SWMU 077), Environmental Health Facility (EHF) (SWMU 079), Kennedy Athletic, Recreation, and Social Park 1 LOC 9 (KARS Park 1) (SWMU 084), Engineering Development Laboratory (EDL) (SWMU 085), Mobil Service Station (MOBIL) (SWMU 093), General Services Administration Seized Property (GSSP) (SWMU 095), Space Station Processing Facility (SSPF) (SWMU 098), and Fuel Storage Area #1 Underground Storage Tank [Building 1044] (FS1) (Potential Release Location [PRL] 157).

Discussion:

Field efforts summarized in this ADP include LTM sampling from May 2022 through November 2022 and Direct Push Technology (DPT) groundwater assessment activities in January 2023 and March 2023. The objective of this ADP is to evaluate the groundwater quality based on current data and trends in order to determine if modifications to the sampling schedule and/or additional measures are warranted.

Fourteen sites are currently in the IA LTM Program and are sampled at various frequencies. These sites were grouped together for convenience in order to combine field efforts and reduce quantities of ADPs and reports.

RRLF

Vinyl chloride (VC) is the contaminant of concern (COC) at RRLF. Groundwater elevation measurements from 14 monitoring wells (MWs) and groundwater samples collected from four MWs in May 2022. Flow direction toward the west-southwest for shallow and toward the west for intermediate groundwater.

Vinyl chloride (VC) was below its Florida groundwater cleanup target level (GCTL) at three MWs (RRLF-MW0033, RRLF-MW0038I, and RRLF-MW0040I) in May 2022. It was recommended to continue monitored natural attenuation (MNA) in the LTM program. The next sampling event at RRLF will be completed in November 2024.

The Team reached consensus to install a new monitoring well with a screen interval of 15 to 25 feet bls at the RRLF-DPT0024 location for RRLF **(2306-D07)**.

The Team reached consensus to continue biennial LTM sampling frequency at the RRLF with now five monitoring wells for vinyl chloride (VC) and collection of 16 water level measurements in November 2024. **(2306-D08)**.

M505

Trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE) and VC are the COCs at M505. Groundwater samples were collected from 8 MWs in May 2022. TCE and cis-1,2-DCE results are below GCTLs at the site. VC was greater than GCTL at three MWs (M505-

MW0013, M505-MW0032, and M505-MW0055) in May 2022. M505 is scheduled for a sampling event in November 2024. It was recommended to continue MNA of the site in the LTM program and adding downgradient monitoring well M505-MW0029 for analysis of TCE, cis-1,2-DCE, and VC.

The Team reached consensus to continue biennial LTM sampling of now nine monitoring wells (which includes addition of M505-MW0029) for trichloroethylene (TCE), cis-1,2-dichloroethene (DCE, and VC and collection of 35 water level measurements in November 2024 at Building M505 (SWMU 039) **(2306-D09)**.

FDEP noted they would like to continue reviewing the data for this site.

O&C

(Note: The sample prefix for this site is O_C.) VC is the COC at O&C. Groundwater samples were collected from two monitoring wells in May 2022. VC was greater than GCTLs at both MWs (O_C-MW0005I and O_C-MW0007I) in May 2022. The O&C is scheduled for a sampling event in November 2024. Recommend continuing MNA in the LTM program and adding downgradient O_C-MW0006I to the water level measurements and sampling schedule.

The Team reached consensus to continue biennial LTM sampling with now three monitoring wells (which includes addition of O_C-MW0006I) for vinyl chloride and collection of five water level measurements in November 2024 for the O&C site (SWMU 076) **(2306-D10)**.

FDEP inquired when was last time water level was gauged in MW06I? How downgradient is this? AECOM stated this well is a distance away and we would like to get one more set of data for MW07I. FDEP contemplated if MW06I data will be meaningful but stated to go ahead and sample as proposed and we will discuss whether MW06I should be added to the monitoring network when results are available.

VPF

TCE, cis-1,2-DCE and VC are the COCs at VPF. Groundwater samples were collected from 6 MWs in May 2022. TCE was greater than GCTLs at three MWs (VPF-MW0021, VPF-MW0025, and VPF-MW0027) in May 2022. Cis-1,2-DCE remains less than GCTLs. VC was greater than GCTLs at two MWs (VPF-IW0018I and VPF-MW0022) in May 2022. The VPF is scheduled for a sampling event in November 2024. Recommend continuing MNA in the LTM program and adding monitoring wells VPF-IW0008D and VPF-IW0010I to the sampling schedule. Recommend installing a shallow monitoring well downgradient of VPF-MW0022 adjacent to VPF-MW0023 with a screen interval of 3-13 feet bls.

The Team reached consensus to install a new monitoring well with a screen interval of 3 to 13 feet bls adjacent to VPF-MW0023 at the VPF site (SWMU 077) **(2306-D11)**.

Test consensus to continue biennial LTM sampling with now nine monitoring wells for TCE, cis-1,2-DCE, and VC and collection of 35 water level measurements in November 2024 at the VPF site (SWMU 077) **(2306-D12)**.

EHF

VC is the COC at EHF. Groundwater samples were collected from 3 MWs in November 2022. VC was greater than its GCTL at EHF-MW0004 in November 2022 and below GCTL at EHF-MW0001 and EHF-MW0005. The EHF is scheduled for a sampling event in November 2024. Recommend continuing MNA in the LTM program.

DPT groundwater sampling was conducted earlier this year at three locations outside the LTM monitoring well locations. VC was detected above its GCTL at EHF-DPT005 to the west of MW04. The Team reached consensus to install a new monitoring well with a screen interval of 15 to 25 feet bls at EHF-DPT0005 location (SWMU 079) **(2306-D13)**.

The Team reached consensus to continue biennial LTM sampling frequency with now four monitoring wells for VC and collection of seven water level measurements in November 2024 at the EHF site (SWMU 079) **(2306-D14)**.

KARS Park 1 Location of Concern 9 (LOC 9)

Lead is the COC at KARS Park 1 LOC 9. LOC 9 groundwater is on a 5-year monitoring frequency. In 2021, an atypical increase in the lead result for the downgradient well (KP1-MW0022) was observed. The sampling team also noted a slight blockage in the MW. For those reasons, MW0022 was re-developed in May 2022 and sampled. Lead was not detected.

This briefing was originally schedule for April 2023 but the meeting was abbreviated. There was a recommendation to accelerate the next sample for MW0022 to May 2023 in that briefing. NASA decided to proceed at risk. Lead was not detected in the May 2023 sample. The May 2023 sampling event details are to be presented in the 2024 ADP and LTM Report.

Monitoring wells KP1-MW0003 and KP1-MW0035 had two consecutive sampling events with lead results below GCTL in November 2020 and September 2021. The total lead concentrations dropped to non-detect at KP1-MW0022 in May 2022 and May 2023. Therefore, recommend discontinuing MNA of groundwater for KARS Park I LOC 9, which will result in all groundwater monitoring at KARS Park I being complete. Other LOCs with groundwater concerns have achieved GCTLs, and soils have been remediated to the residential soil cleanup target levels.

KP1-MW0017 was found destroyed during the May 2023 sampling event. Recommend proper abandonment of this well. FDEP asked whether there was there an exceedance at MW17? AECOM stated it had two consecutive clean events in 2005 and 2006.

The Team reached consensus to discontinue MNA of groundwater at KARS Park I (SWMU 084) **(2306-D15)**. FDEP will review the report before formal approval.

The Team reached consensus to abandon monitoring well KP1-MW0017 at KARS Park I (SWMU 084) **(2306-D16)**.

EDL

VC is the COC at EDL. DPT groundwater sampling at three locations along the south side of the site to evaluate adequacy of the current monitoring well network. VC was not detected above its GCTL at any location. VC horizontal delineation is complete with recent DPT sampling along the southern boundary.

VC is greater than GCTL at the two MWs (EDL-MW0004 and EDL-MW0006R) currently in the LTM program in November 2022. The EDL is scheduled for a sampling event in November 2024. Recommend continuing MNA in the LTM program.

The Team reached consensus to continue current sampling schedule, which includes November 2024 LTM sampling of two monitoring wells (EDL-MW0004 and EDL-MW0006R) for VC and collection of four water level measurements at the EDL site (SWMU 085) **(2306-D17)**.

FDEP inquired during DPT investigation why did you not go to the north side as well? NASA responded that the north side of the plume had been investigated by DPT as part of the historical delineation at the site. During a data gap evaluation, NASA identified that the southern boundary was not investigated in the way the rest of the site was. That is why we did the southern side only. NASA can provide the package pulled together for FDEP's former Project Manager for KSC and provide to FDEP for review.

The 1.5 µg/L result at monitoring well EDL-MW006R was noted to be really low. The Team will continue to monitor until we are two rounds clean.

MOBIL

(Note: The sample prefix for this site is CGO since the service station was formerly a Citgo station.) The COCs at Mobil are benzene, 1,2,4-trimethylbenzene (1,2,4-TMB), xylenes, methyl tert butyl ether (MTBE), naphthalene, 1- and 2-methylnaphthalene. LTM samples were collected from 3 monitoring wells in May 2022. 1,2,4-TMB and MTBE were greater than GCTLs at CGO-MW0018 in May 2022. CGO-MW0019 was added to the sampling schedule following the 2020 sampling event; analytes were below GCTLs in May 2022. The MOBIL is scheduled for a sampling event in November 2024. Recommend continuing MNA in the LTM program and abandoning 9 historically clean perimeter monitoring wells (CGO-MW0002, CGO-MW0003, CGO-MW0004, CGO-MW0008, CGO-MW0009, CGO-MW0010, CGO-MW0012, CGO-MW0013, and CGO-MW0016).

The Team reached consensus to continue biennial LTM sampling of CGO-MW0018 and CGO-MW0019 for select volatile organic compounds (VOCs) (benzene; 1,2,4-TMB; xylenes; and MTBE) and CGO-MW0006 for the same VOCs plus naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene, and collection of nine water level measurements in November 2024 at the MOBIL site (SWMU 093) **(2306-D18)**.

The Team reached tentative consensus to abandon nine historically clean perimeter monitoring wells (CGO-MW0002, CGO-MW0003, CGO-MW0004, CGO-MW0008, CGO-MW0009, CGO-MW0010, CGO-MW0012, CGO-MW0013, and CGO-MW0016) at the MOBIL site (SWMU 093) **(2306-D19)**.

FDEP reserves the right to review the upcoming report before concurring with the well abandonment.

GSSP

The COCs at GSSP are tetrachloroethene (PCE), TCE, cis-1,2-DCE, trans-1,2-DCE, VC and naphthalene. Groundwater samples were collected from 14 MWs in November 2022. VC results were greater than GCTLs at 5 MWs (GSSP-MW0019, GSSP-MW0020, GSSP-MW0035, GSSPMW0053, and GSSP-MW0062) and also above the natural attenuation default concentration (NADC) at GSSP-MW0020. Naphthalene is greater than GCTL at GSSP-MW0024R. Other analytes were below their GCTLs for at least the fourth consecutive sampling event. Recommend reducing site COCs to VC and naphthalene

Recommend continuing MNA in the LTM program. GSSP is scheduled for a regular sampling event in November 2023. A 5-year expanded sampling event is scheduled for November 2024, when 23 MWs will be sampled.

FDEP inquired if there was a closed loop injection at this location. AECOM stated there was a recirculation system with both injection and extraction wells so believe it was a closed loop. FDEP inquired if there was petroleum at this location. AECOM responded there was the only known release was PCE. NASA stated that the naphthalene is downgradient in two wells and may have been the result of mowing operations.

FDEP inquired when was the last time GSSP-MW0027 and GSSP-MW0028 were sampled? Monitoring well GSSP-MW0054 is also high too. If it has been more than a decade you may want to sample those wells again. Action item for AECOM to get back with FDEP with this information **(2306-A02)**.

The Team reached consensus to continue annual LTM sampling of 14 monitoring wells for VC with three select monitoring wells also sampled for naphthalene and collect 33 water level measurements in November 2023 at the GSSP site (SWMU 095) **(2306-D20)**.

FDEP inquired if we want more VOCs thrown in we can add in November. Are there additional costs to only run VC or is it the suite? AECOM stated it is all the same cost. FDEP agrees with this for November and, if needed, to add more later on.

SSPF

Ammonia is the COC at SSPF. Groundwater samples were collected from 5 MWs in May 2022. Ammonia was greater than GCTLs at four MWs and greater than twice the KSC background in three MWs (SSPF-MW0006, SSPF-MW0014, and SSPF-MW0016) in May 2022, yet continue overall stable and decreasing trends. Recommend continuing MNA in the LTM program. Next sampling event is scheduled for November 2024.

FDEP inquired if the alternative cleanup target level (CTL) calculations are being used for ammonia at this site. That number may be higher than the background levels. NASA is happy to look at the alternative CTL based on the potential to eliminate this site.

The Team reached consensus to continue biennial sampling of five monitoring wells for ammonia and collect 15 water level measurements in November 2024 at the SSPF site (SWMU 095) **(2306-D21)**.

FDEP inquired if conditional closure has been considered for this location? NASA stated for the program they typically look for unconditional closure. The Department prefers that as well and understands if that is the chosen path forward.

FSA1

The COCs at FSA 1 are benzene, ethylbenzene, isopropylbenzene, 1- and 2-methylnaphthalene, naphthalene, and total petroleum hydrocarbons (TPH). Groundwater samples were collected from 10 MWs in May 2022. Isopropylbenzene was greater than GCTLs at four MWs (FSA1-MW0001, FSA1-MW0002, FSA1-MW0017A, and FSA1-MW0021) and greater than NADC at FSA1-MW0001. 1- and 2-Methylnaphthalene were greater than GCTLs at FSA1-MW0001 in May 2022. Recommend discontinuing naphthalene (which has been below its GCTL since 2019) and TPH (which has been below its GCTL since 2021) analyses. Recommend continuing annual LTM sampling in alternating seasons. The next scheduled sampling event at FSA1 is November 2023.

FDEP inquired if fluctuations correlate with depth to water at this site. AECOM confirmed they do.

The Team reached consensus to continue annual LTM sampling of 10 monitoring wells for select VOCs (isopropylbenzene) and select polynuclear aromatic hydrocarbons (1-methylnaphthalene and 2-methylnaphthalene) and collect 18 water level measurements in November 2023 at the FSA1 site (PRL 157) **(2306-D22)**.

FDEP inquired if there were naphthalene spikes on the last samples. AECOM confirmed there was a little bump up in the numbers.

FDEP inquired if the Team has naphthalene trends on the ADP to which the response was there are not.

**Results: Decision Items 2306-D7 through D22
Action Item 2306-A02**

2306-M08 Mark Jonnet/Tetra Tech

**Area South of K7-0516 (SWMU 100) Interim Measure
Operation, Maintenance and Groundwater Monitoring Update,
June 2023**

Objective: This advance data package (ADP) provides a summary of the air sparge treatment system operations and maintenance, performance groundwater sampling, and test consensus statements for a path forward.

June 2023 Decision Items Rev 2		Decision
Decision No.	Minutes Reference	
2306-D01	2306-M01	Meeting Minutes and Miscellaneous Items: Reviewed the outstanding consensus items. Obtained consensus that Revision 1 of the April 2023 KSCRT meeting minutes and action items are final. Team members are aware and do not object that meeting minutes and decision/action items may become public as part of a report at a later date.
2306-D02	2306-M04	False Cape Data Collection Annex (SWMU 113) Monitoring Well Network: Team consensus was reached to install monitoring wells at the recommended locations on Slide 21, with the addition of a well installed for vertical delineation at location MW-F.
2306-D03	2306-M05	Soil Interim Measures at Various Sites (South Water Pump Station [PRL 213]): The Team reached consensus for No Further Action (NFA) for soil and groundwater at the site.
2306-D04	2306-M05	Soil Interim Measures at Various Sites (South Water Pump Station [PRL 213]): The Team reached consensus that a Site Rehabilitation Completion Order Request Letter will be prepared.
2306-D05	2306-M06	Convertor/Compressor Building (SWMU 089) Annual Performance Monitoring Update: The Team reached consensus to transition from PM to LTM with next reporting period (January 2023 – December 2023) as Year 1 of LTM.
2306-D06	2306-M06	Convertor/Compressor Building (SWMU 089) Annual Performance Monitoring Update: The Team reached consensus to continue sampling 25 wells plus MW62 and MW64 annually in December 2023 and 23 wells biennially in December 2024 to monitor VOC contaminant trends; well IDs and sampling frequency are shown on Slide 18 of the presentation. Sampling results will be presented to the KSCRT prior to submittal of 2023 Annual LTM Report.
2306-D07	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to install a new monitoring well with a screen interval of 15 to 25 feet bls at the RRLF-DPT0024 location for RRLF.
2306-D08	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue biennial LTM sampling frequency at the RRLF with now five monitoring wells for vinyl chloride (VC) and collection of 16 water level measurements in November 2024.
2306-D09	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue biennial LTM sampling of now nine monitoring wells (which includes addition of M505-MW0029) for trichloroethylene (TCE), cis-1,2-dichloroethene (DCE, and VC and collection of 35 water level measurements in November 2024 at Building M505 (SWMU 039).
2306-D10	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue biennial LTM sampling with now three monitoring wells (which includes addition of O_C-MW00061) for vinyl chloride and collection of five water level measurements in November 2024 for the O&C site (SWMU 076).
2306-D11	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to install a new monitoring well with a screen interval of 3 to 13 feet bls adjacent to VPF-MW0023 at the VPF site (SWMU 077).
2306-D12	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: Test consensus to continue biennial LTM sampling with now nine monitoring wells for TCE, cis-1,2-DCE, and VC and collection of 35 water level measurements in November 2024 at the VPF site (SWMU 077).
2306-D13	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: Team reached consensus to install a new monitoring well with a screen interval of 15 to 25 feet bls at EHF-DPT0005 location (SWMU 079).
2306-D14	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue biennial LTM sampling frequency with now four monitoring wells for VC and collection of seven water level measurements in November 2024 at the EHF site (SWMU 079).
2306-D15	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to discontinue MNA of groundwater at KARS Park I (SWMU 084).
2306-D16	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to abandon monitoring well KP1-MW0017 at KARS Park I (SWMU 084).
2306-D17	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue current sampling schedule, which includes November 2024 LTM sampling of two monitoring wells (EDL-MW0004 and EDL-MW0006R) for VC and collection of four water level measurements at the EDL site (SWMU 085).
2306-D18	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue biennial LTM sampling of CGO-MW0018 and CGO-MW0019 for select volatile organic compounds (VOCs) (benzene; 1,2,4-TMB; xylenes; and MTBE) and CGO-MW0006 for the same VOCs plus naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene, and collection of nine water level measurements in November 2024 at the MOBIL site (SWMU 093).
2306-D19	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached tentative consensus to abandon nine historically clean perimeter monitoring wells (CGO-MW0002, CGO-MW0003, CGO-MW0004, CGO-MW0008, CGO-MW0009, CGO-MW0010, CGO-MW0012, CGO-MW0013, and CGO-MW0016) at the MOBIL site (SWMU 093).
2306-D20	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue annual LTM sampling of 14 monitoring wells for VC with three select monitoring wells also sampled for naphthalene and collect 33 water level measurements in November 2023 at the GSSP site (SWMU 095).
2306-D21	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue biennial sampling of five monitoring wells for ammonia and collect 15 water level measurements in November 2024 at the SSPF site (SWMU 095).
2306-D22	2306-M07	Industrial Area (IA) Long-Term Monitoring (LTM) Update: The Team reached consensus to continue annual LTM sampling of 10 monitoring wells for select VOCs (isopropylbenzene) and select polynuclear aromatic hydrocarbons (1-methylnaphthalene and 2-methylnaphthalene) and collect 18 water level measurements in November 2023 at the FSA1 site (PRL 157).
2306-D23	2306-M08	Area South of K7-0516 (SWMU 100) Interim Measure Operation, Maintenance and Groundwater Monitoring Update: The Team reached consensus to continue annual monitoring of MWs 01, 02, 07ID, 44, 45, 46, and 81 in the upgradient Eastern plume area with samples analyzed for VOCs by 8260B.
2306-D24	2306-M08	Area South of K7-0516 (SWMU 100) Interim Measure Operation, Maintenance and Groundwater Monitoring Update: The Team reached consensus that the IM is operating as designed and to continue operation of the same sparging wells operated in 2022 to prevent upgradient contamination from impacting the treated zone.
2306-D25	2306-M08	Area South of K7-0516 (SWMU 100) Interim Measure Operation, Maintenance and Groundwater Monitoring Update: The Team reached consensus to conduct semi-annual sampling of MW21R to determine if VC decreases to less than GCTLs.
2306-D26	2306-M08	Area South of K7-0516 (SWMU 100) Interim Measure Operation, Maintenance and Groundwater Monitoring Update: The Team reached consensus to continue annual sampling of wells 09, 10, 11, 12, 20, 49, 71, and 72 with all groundwater samples to be analyzed for VOCs by 8260B.

KSCRT Status of Open Action Items

Action Item No.	Minutes Reference	Responsible Team Member	Action item	Status	Comments
1712-A01	1712-M07	Team	If a document contains materials controlled under EAR99 (as determined by Export Control), the following clause shall be included on the first page (Action item): "EAR99 – NO LICENSE REQUIRED This information or item is controlled under the Export Administration Regulations (EAR) as EAR99. It may be exported without a license, except to embargoed/designated countries (General Provision Six) or entities of concern. The designation of EAR99 does not constitute public release. Per Lori Ray, Reference STI TN#### NASA KSC Export Control Office, 321-867-9209."	Open	Standing Open Item
1810-A01	1810-M01	Team	NASA legal is concerned about copyright infringement regarding the inclusion of lab reports in documents. Reach out to labs to get release statements from them for the lab reports.	Open	Standing Open Item
2002-A03	2002-M10	A&Es	NASA requests that all A&E firms please large file transfer the .pdf and PowerPoint versions of the ADPs being presented so they can be uploaded to the folder and utilized for the team meeting. Cover letters should summarize the goal of the ADPs and the consensus statements should be provided for the minutes.	Open	Standing Open Item
2102-A09	2102-M13	Team	General Comment: FDEP observed that, based on the current monitoring network and plume depiction, one could think the plume is not delineated. Trepidations exist about making decisions without understanding how MNA has progressed. For clarity moving forward, the NASA lead requested that future documents include the end point assessment map that shows that we have plume delineation at a site, as well as a cross-section reference (e.g., what was the last map that brought us to the point of LTM, and where are we now [all the circa data circa]).	Open	Standing Open Item
2102-A07	2102-M13	NASA (RPO)	Industrial Area LTM, February 2021 (ORSY Site): FDEP inquired about past results for monitoring well ORSY-DRM-MW00011. NASA stated they will look into the historical sampling results and get back with the Team.	Open	Findings and recommendations were submitted to FDEP. NASA is implementing the recommendations and will be revisited at a later date.
2102-A08	2102-M13	NASA (RPO)	Industrial Area LTM, February 2021 (EHF Site): FDEP and NASA discussed the site. NASA stated that the MNA program is routinely optimized, but this site was never included in an engineering evaluation process. Mounding takes place at this location, and a building was removed in the past few years. NASA took an action item to review the sampling data in the RFI for this location.	Open	Findings and recommendations were submitted to FDEP. NASA is implementing the recommendations and will be revisited at a later date.
2102-A10	2102-M13	NASA (RPO)	Industrial Area LTM, February 2021 (M7-505 Site): NASA took an action item to investigate if there are deeper data points around the location of MW0033.	Open	Findings and recommendations were submitted to FDEP. NASA is implementing the recommendations and will be revisited at a later date.
2102-A11	2102-M13	NASA (RPO)	Industrial Area LTM, February 2021 (GSSP Site): FDEP inquired if this site was delineated to the northwest of the lake, and if we have vertical delineation at this location. NASA stated a site characterization was performed in 2012. In 2009, DPT55 was placed on the west side of the pond (west of MW0035) and DPT56 was located on the east side of the pond (20ft NW of the location of monitoring wells MW0033, MW0034, and MW0035). On the west side there were no detections, and on the east side there were low detections. Surface water was also sampled here. NASA took an action item to provide this data to FDEP for reference following the meeting.	Open	Findings and recommendations were submitted to FDEP. NASA is implementing the recommendations and will be revisited at a later date.
2102-A12	2102-M13	NASA (RPO)	Industrial Area LTM, February 2021 (KARS Park 1 Site): FDEP inquired if this was a skeet range previously? NASA stated there was a rifle/pistol range with a skeet range to the west (reference slide 154). FDEP inquired on the groundwater in the rifle/pistol range area? NASA stated that the groundwater was not monitored in that area. Tetra Tech pulled up the old wells in a previous presentation figure during the meeting. The only well shown in the area of discussion was in the lead shot area (KP1-MW0007). FDEP stated they would like to know what happened west of LOC 9 if NASA can provide that data. NASA took an action item to look into this.	Open	Findings and recommendations were submitted to FDEP. NASA is implementing the recommendations and will be revisited at a later date.

KSCRT Status of Open Action Items

Action Item No.	Minutes Reference	Responsible Team Member	Action item	Status	Comments
2106-A01	2106-M03	NASA/FDEP	NASA Remediation Program Updates, June 2021: FDEP stated that, regarding the existing Statement of Basis template being acceptable, it would be best for FDEP and NASA to have a follow up meeting to review the current template. FDEP and NASA can decide from there.	Open	
2106-A02	2106-M03	NASA/FDEP	NASA Remediation Program Updates, June 2021: Regarding updating the Statement of Basis (SB) for a site after an IM has taken place (post initial SB publication), FDEP agrees that this is an administrative item and it does have significance. For the Federal Facilities Branch, it may not be critical to see the change in SB post IM, but the RCRA Program may have a different perspective. We need an understanding of what are considered significant changes on the permit, what triggers public notification, etc. That is a conversation NASA and FDEP should have to provide firmer ground on what is required going forward.	Open	Most of this has been addressed in the current permit modification, but still need a follow up meeting with FDEP to discuss the SB requirements.
2203-A05	2203-M09	NASA	Industrial Area (IA) Long-Term Monitoring (LTM) Update, March 2022: FDEP requested a brief letter report with the findings to support discontinuing the MNA at this OSRY (SWMU 004) site for groundwater. NASA confirmed it would provide this.	Open	This is being worked currently.
2210-A01	2210-M02	NASA	C-5 Electrical Substation (SWMU #066) Groundwater Monitoring Report and Long-Term Monitoring Work Plan: NASA stated that the well with the detection is the downgradient well. There was not a detection in the upgradient well; it was a "J" exceedance. There may be surface water and groundwater interaction at that location. Perhaps under the Center-wide investigation, we can do a co-located sample at this location. This will be an action item for NASA and AECOM to discuss	Open	NASA discussed with AECOM (under Center-wide Investigation) who will collect a surface water sample at this location and collect a sample from the existing monitoring well.
2210-A03	2210-M03	NASA	LC39A Operations Support Building Area (AOSB) (SWMU #111) Year One Performance Monitoring, October 2022: The Team reached consensus to include PFAS analyses for MWs 10 and 11 during the semi-annual sampling events. FDEP inquired if this was going to be an effort included under a larger investigation eventually? NASA responded that the center is co-located with water bodies, and the river could be a source. There is a PFAS source associated with a former STP, but that is not located here. It may be worth adding a surface water sample to this area. Let's talk about our Center-wide investigation first and how this might tie in.	Open	This will be addressed under the Center-wide PFAS investigation.
2210-A05	2210-M05	NASA	LC39B (SWMU 009) LOX Area DPT Investigations and Air Sparging: FDEP referring to Slide 27 inquired why staining samples aren't sent to the lab? How do you ascertain whether there is petroleum in that interval? Tetra Tech stated if they didn't see the visual stain, they sent it to the lab for the other contaminants of concern (COCs). However, that is an easy addition to sample for. FDEP instructed the Team to collect from that interval and send the samples to the lab, versus performing a visual inspection.	Open	Soil samples will be collected in the future
2210-A10	2210-M10	NASA	Base Support Building (SWMU 014) and KARS Park II (SWMU #118) PFAS Site Assessment Report: NASA took an action item to sample the borrow pit to the west of KARS Park II.	Open	This will be addressed under the Center-wide PFAS investigation.
2304-A02	2304-M04	NASA	CCB SWMU #089 - MW21 Area Groundwater IMWP: Action item was added to look for this information (sodium and TDS) and submit to FDEP for their information.	Open	TDS sampling was available. Chris Adkison going to check further. If no sodium available then NASA will recommend sampling of three background wells moving forward for sodium and TDS. TDS and sodium were both available but old data. Will include the sampling of background wells for sodium and TDS moving forward.
2304-A03	2304-M04	NASA	CCB SWMU #089 - MW21 Area Groundwater IMWP: Tetra Tech will provide FDEP the trade names of the proposed chemicals to be used at the site via email as soon as possible.	Open	Follow up emails determined the trade name proposed has not been approved yet. Tetra Tech is following the process to get this chemical approved for use at this location and for future use.
2306-A01	2306-M04	NASA	False Cape Data Collection Annex (SWMU 113) Monitoring Well Network: FDEP recommended a well installation at the MW-F location. NASA will confirm the depth of this new well in an email to FDEP.	Open	
2306-A02	2306-M07	NASA	Industrial Area (IA) Long-Term Monitoring (LTM) Update : FDEP inquired when was the last time GSSP-MW0027 and GSSP-MW0028 were sampled? Monitoring well GSSP-MW0054 is also high too. If it has been more than a decade you may want to sample those wells again. Action item to get back with FDEP with this information.	Open	
2306-A03	2306-M09	NASA	GSA Reclamation Yard (SWMU 10) Shallow Soil Polychlorinated Biphenyl (PCB) Site Assessment and Proposed Interim Measures (IM) Work Plan: Chapter 62-780 of the Florida Administrative Code requires delineation to below CTLs in every direction. Buildings and paved surfaces are being used in some areas as boundaries of the proposed excavation areas, and delineation is not complete beyond the southwest fence line. AECOM will need to take a look at that (southwest corner).	Open	
2306-A04	2306-M12	NASA	Miscellaneous Discussion: The CCB project team heard back on Provect IR60; it is covered under the previous Provect IR. Tetra Tech will forward FDEP the approval email (to Jason French). It looks like we are good to use that product for the Converter Compressor Building MW21 area.	Open	

KSCRT Closed Action Items

Action Item No.	Minutes Reference	Responsible Team Member	Action item	Status	Date Closed	Closure Comments
2012-A01	2012-M02	NASA (Deda Johansen)	<u>Maintenance and Operations (M&O) Building (SWMU #014) Confirmation Sampling Work Plan for Soil Land Use Control Implementation Plan (LUCIP) Removal, December 2020</u> ; NASA (Deda Johansen) took an action item to look more into the site history for data from the prior investigation	Closed	2/17/2021	A bibliography with brief descriptions of document content was prepared. It will be included in HGL's upcoming Confirmatory Sampling Work Plan for Soil LUCIP Close-out
2012-A02	2012-M03	NASA (Mike Deliz)	<u>Review of Site Status and Deliverables, December 2020</u> ; FDEP inquired if NASA will be going over the outstanding CAMP documents later on, or if a list could be provided. NASA (Mike Deliz) took an action item to consolidate and send the outstanding document summary to FDEP	Closed	2/17/2021	A consolidation of the outstanding CAMP documents was provided to FDEP following the meeting
2102-A01	2102-M05	NASA (DJ)	<u>Contractors Road Heavy Equipment Area (SWMU #055) 2020 Annual Groundwater Monitoring, February 2021</u> : FDEP asked about the TDS and sodium results in the bioremediation area that are above Class GII groundwater standards. NASA responded that the sodium and TDS are compared to the KSC background levels, and took an action to provide the approved plan and data to FDEP for future reference.	Closed	4/28/2021	Completed - NASA sent both the background study and the approval letter to FDEP on 2/19/2021. A follow-up meeting was held between NASA, FDEP and HGL on 3/1/2021. FDEP requested a copy of the Decision Process Document, and as a follow-on later requested a copy of the actual background study. On 4/18/2021, FDEP recommended that NASA identify a suite of wells at the site that can be used to generate site-specific background information. NASA will follow that recommendation.
2102-A02	2102-M05	NASA (DJ)	<u>Contractors Road Heavy Equipment Area (SWMU #055) 2020 Annual Groundwater Monitoring, February 2021</u> : FDEP inquired if NASA has an UIC approval order to identify what NASA is using? NASA stated UIC monitoring was approved as part of the IM work plans that will be provided to FDEP .	Closed	4/28/2021	NASA provided FDEP with the 2016 and 2018 Bioremediation Work Plans that included the UIC Notifications as an appendix in each.
2102-A03	2102-M05	NASA (DJ)	<u>Contractors Road Heavy Equipment Area (SWMU #055) 2020 Annual Groundwater Monitoring, February 2021</u> : FDEP inquired if the Team resampled for benzene and chloroform at the site, and found these not to be a risk? NASA performed a real-time investigation during the KSCRT meeting of past data and did not find resampling of benzene. Since no soil benzene source was identified in soil or groundwater, and the detections did not exceed the commercial level, NASA submitted these sampling results to the NASA Industrial Hygiene Office for review. FDEP would like to see the email to help understand the resampling and rationale of the dropping of these chemicals off the sampling list. NASA will provide this benzene data to FDEP and have a discussion to review the data and also the UIC information from May/June 2014.	Closed	4/28/2021	NASA sent the Vapor Intrusion Memorandum to FDEP on 2/19/2021. A follow-up meeting was held between NASA, FDEP and HGL on 3/1/2021. FDEP's primary concern was that the sub-slab vapor results would be acted on if needed. NASA explained that KSC's Industrial Hygienist was consulted about the findings which FDEP had concerns about and found no need for action, and that vapor sampling results will continue to be provided to KSC's Environmental and Occupational Health organization.
2102-A04	2102-M10	NASA (DJ)	<u>GSA Reclamation Yard (SWMU#010), DPT Results, February 2021</u> : FDEP pointed out that the iron in monitoring well MW0071 exceeded the secondary standard. What is the basis for not including monitoring well MW0071? NASA responded that the results for iron were within the range of background values for KSC, and will provide documentation. FDEP stated that site-specific background data may be needed at some point. NASA took an action item to look at the RFI for that data, and provide to FDEP.	Closed	4/28/2021	The RFI and CMS groundwater metals data for GSRY were reviewed. The majority of the data are from the upper horizon of the aquifer (30 ft. or shallower), while the zone treated with Provect-OX™ was 40-50 ft below ground surface. In the 2021 wet season groundwater sampling event, samples for iron will be collected from a site well outside the treated area.
2102-A05	2102-M13	NASA (RO)	needs to be a downgradient well establishing the extent of the plume at FSA1 (PRL #157). Do we have one? AECOM took an action item to look into that request	Closed	4/28/2021	NASA will be installing a downgradient well.
2102-A06	2102-M13	NASA (RO)	<u>Industrial Area LTM, February 2021 (FSA1 Site)</u> : NASA stated they will take a look into the prior DPT data to see if we need to install that well and provide the Team with an update and make a recommendation	Closed	4/28/2021	NASA will be installing a downgradient well.
2104-A01	2104-M04	NASA (AMC)	<u>Area South of K7-0516 and Eastern Component Cleaning Facility (SWMU #030) Interim Measure, Operation, Maintenance, & Monitoring, and Performance Monitoring and Interim Groundwater Monitoring, April 2021</u> : An action item to incorporate surface water sampling into the CCF monitoring program was assigned to NASA and Tetra Tech	Closed	6/22/2021	This surface water sampling was incorporated in the barge canal sampling program moving forward.

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Revision 1 Meeting Minutes for February 7, 2024

Attendees:

1. TJ Touran/FDEP
2. Jason French/FDEP
3. Ryan O’Meara/NASA
4. Deda Johansen/NASA
5. Anne Chrest/NASA
6. Chris Adkison/NASA
7. Michelle Moore/NEMCON
8. Mark Jonnet/Tetra Tech
9. Mark Speranza/Tetra Tech
10. Debbie Wilson/Tetra Tech
11. Jennifer Buel/Tetra Tech
12. Sarah Damphousse/Tetra Tech
13. Andrew Walters/Tetra Tech
14. Theresa Thompson/Tetra Tech
15. Chris Neumann/Tetra Tech
16. Theresa Thompson/Tetra Tech
17. Chris Pike/Tetra Tech
18. Haley Hook/Tetra Tech
19. Scott Anderson/Tetra Tech
20. Jennifer Gootee/AECOM
21. Greg Kusel/AECOM
22. Brad Sperry/ HGL
23. Bruce Moore/HGL
24. Richard Smith/HGL

2402-M01 Michelle Moore/NEMCON

Meeting Minutes and Miscellaneous Items

Objective:

Review open action items for possible closure.

Discussion:

The November 2023 KSCRT meeting minutes and action/decision items were sent out on February 7, 2024, with a two-week review period. Consensus was tested via email to finalize these meeting minutes over email as well.

Post meeting, minutes were reviewed, revised, and voted on. The Team reached consensus on March 27, 2024, that the meeting minutes and action/decision items were final. Team members acknowledged that these meeting minutes may become part of public record in a report at a later date (**2402-D01**).

NASA took an action item to evaluate the LCP with some amount of DPT and propose monitoring well locations that will be presented in Year 4 (**2402-A05**).

**Results: Decision Items 2402-D12 through D18
Action Items 2402-A04, A05**

2402-M08 Greg Kusel/AECOM

KSC Industrial Area (IA) LTM Various Sites

Objective: The purpose of this ADP is to present activities and data associated with eleven IA LTM sites:

- Kennedy Athletic, Recreation, and Social Park 1 - LOC 9 (SWMU 084)
- Launch Equipment Test Facility (LETF) (SWMU 091)
- General Services Administration Seized Property (SWMU 095)
- Fuel Storage Area #1 Underground Storage Tank [Building 1044] (Potential Release Location [PRL] 157)

Discussion:

Field efforts summarized in this ADP include LTM sampling in May 2023 and November 2023. The objective of this ADP is to evaluate the groundwater quality based on current data and trends to determine if modifications to the sampling schedule and/or additional measures are warranted.

At the Kennedy Athletic, Recreation, and Social Park 1, the Team reached consensus to maintain Decision 2306-D15 to discontinue LTM of groundwater at LOC 9 (**2402-D19**).

The LETF site was discussed and FDEP inquired if MW0001 had the exceedance? AECOM confirmed that it was and FDEP inquired if sampling upgradient was conducted or if we sampled for parent products? NASA was unsure if sampling was conducted inside the building. This site was characterized and air sparged in 2013.

NASA offered when submitting the report to attach history of this site. NASA will provide information to AECOM to include in the submittal (**2402-A06**).

Five years ago, the Team tried to identify data gaps and can provide this information to FDEP. There may be potential rebound in this area. FDEP may want to test for parent products in this area.

The Team reached consensus to continue biennial sampling frequency **(2402-D20)**.

At the LETF, the Team reached consensus to continue biennial sampling frequency with two monitoring wells sampled for CVOCs, and water level measurements at 14 monitoring wells **(2402-D21)**.

At the General Services Administration Seized Property, the Team reached consensus to continue annual LTM sampling with the addition of GSSP-MW0028 for water level measurements **(2402-D22)**.

The Team reached consensus to add GSSP-MW0028 and GSSP-MW0054 to the 5-year expanded sampling event for VC analysis **(2402-D23)**.

The Team reached consensus to collect 34 water level measurements and sample 25 monitoring wells during the November 2024 expanded sampling event to include:

- Sample for vinyl chloride (VC) at the 25 sampled monitoring wells.
- Sample naphthalene at GSSP-MW0024R, GSSP-MW0035, and GSSP-MW0053.
- Sample methane, ethane, and ethene (MEE); Dehalococoides (Dhc); and total organic carbon at GSSP-MW0019, GSSP-MW0020, and GSSP-MW0053 **(2402-D24)**.

NASA stated that since the mass has moved, they didn't see the value of sampling where there was no mass. After the next round of sampling the Team can reevaluate this moving forward.

To clarify, the Space Force also has an FSA #1 site as well. This small area where former facility 1044 used to be housed is the area that NASA is responsible for.

For FSA #1, the Team reached consensus to remove FSA1-MW0012R, FSA1-MW0014, and FSA1-MW0028 from the sampling schedule (2402-D25).

The Team reached consensus to add FSA1-MW0019 to the sampling schedule (2402-D26).

The Team reached consensus to continue annual LTM sampling of 8 monitoring wells for select VOCs (isopropylbenzene) and select PAHs (1-methylnaphthalene and 2-methylnaphalene) and collect 18 water level measurements in May 2024 (2402-D27).

**Results: Decision Items 2402-D19 through D27
Action Items 2402-A06**

2402-M09 Debbie Wilson/Tetra Tech

Launch Complex 39A (SWMU 008) Long-Term Monitoring Report (LTMR)

Objective: The purpose of the ADP is to present the long-term monitoring results at Launch Complex 39A.

Discussion: An overview of the former groundwater interim measures and air sparging system shutdown activities was provided. The data evaluation includes long-term groundwater monitoring and limited monitoring well sampling for PFAS analysis.

This ADP includes air sparging system shutdown activities, monitoring well installation, and data evaluation for long-term monitoring events conducted in May 2023 and November 2023. System operation was discontinued at the end of December 2022.

Remaining VOC concentrations in the groundwater are less than NADCs. TCE, cDCE, and tDCE concentrations observed in Inside Fence line wells are less than GCTLs. The maximum VC concentration observed was 8 µg/L in 21ST-MW0016S. In the LOX Area, all VOC concentrations were less than GCTLs. There was one detection of VC at a concentration of 1.4 µg/L in MW0011.

A new well, MW0046, was installed downgradient of MW0011 to get closer to the OFW. The path forward for this site is to prepare and submit the Long-Term Monitoring Report.

Revision 1 Meeting Minutes for April 24, 2024

Revision 1 Meeting Minutes for April 24, 2024

Attendees:

- | | |
|-----------------------------|---------------------------|
| 1. TJ Touran/FDEP | 10. Chris Marshall/AECOM |
| 2. Natasha Darre/NASA | 11. Jennifer Gootee/AECOM |
| 3. Deda Johansen/NASA | 12. Justin Vojak/HGL |
| 4. Anne Chrest/NASA | 13. Jason Bublitz/HGL |
| 5. Chris Adkison/NASA | 14. Tim Jellett/ HGL |
| 6. Michelle Moore/NEMCON | 15. Richard Smith/HGL |
| 7. Mark Jonnet/Tetra Tech | |
| 8. Mark Speranza/Tetra Tech | |
| 9. Debbie Wilson/Tetra Tech | |

2404-M01 Michelle Moore/NEMCON

Meeting Minutes and Miscellaneous Items

Objective:

Test consensus on February 2024 Team meeting minutes.

Discussion:

Team consensus was reached that Revision 1 of the meeting minutes and action/decision items for the February 2024 Team meeting will become final. Team members acknowledged and did not object to the fact that these meeting minutes may become public record as part of a final report at a later date (**2404-D01**).

FDEP's TJ Touran provided an update on the program. Scott Miller will be taking over Patrick Space Force Base and Cape Canaveral Space Force Station. TJ will be focused on managing the KSC installation, as well as the grant applications and budgeting for the Federal Programs team since he has a business background.

Results: Decision Item 2404-D01

2404-M02 Jason Bublitz/HGL

Contractors Road Heavy Equipment Area (SWMU 055) Annual Long-Term Monitoring:

Objective: The objective of the ADP is to summarize the site description, history, previous investigations, present the December 2023

Test consensus to continue SSSG sampling for chlorinated VOCs in June and December 2024, to evaluate if there are changes in SSSG at the four sampling points due to previous interim measure activities or plume movement (2404-D06).

Results: Decision Item 2404-D02 through D06

2404-M03 Deda Johansen/NASA

Space Station Processing Facility (SWMU 098) No Further Action Recommendation:

Objective: The objective of the Advance Data Package (ADP) is to present a summary of the un-ionized ammonia calculations, propose use of the alternative groundwater cleanup target levels (ACTLs) for un-ionized ammonia at the Space Station Processing Facility (SSPF), and discuss the path forward.

Discussion:

Deda provided an introduction and noted, if the Team concurs, we will discontinue groundwater monitoring at this site.

Under the Clean Air Act, ammonia handling operations at SSPF are required to report to FDEP any vapor releases of ammonia exceeding 100 pounds per day. A 2005 Solid Waste Management Unit (SWMU) assessment noted three releases exceeding 100 pounds of ammonia. The routine daily release was estimated at 25 pounds per day. Confirmation Sampling (CS) in 2006 identified ammonia in groundwater at SSPF exceeding the Florida Groundwater Cleanup Target Level (GCTL). A Resource Conservation and Recovery Act Facility Investigation (RFI) was conducted from 2007 through 2009, confirming ammonia exceeding the GCTL but less than the Natural Attenuation Default Concentration (NADC).

KSC prepared a Center-wide Ammonia in Groundwater Background Study for KSC, Florida, in August 2009, which established a mean background ammonia concentration of 1,860 µg/L for sites with documented sources or releases. In the 2010 SSPF Statement of Basis (SB), long-term monitoring (LTM) was the selected remedial strategy, and the cleanup goal was established as 2x the KSC

background levels. The SSPF entered the LTM program in 2010, biennial frequency was initiated in 2012.

Total ammonia concentrations have been stable for the past 10 years. Mann-Kendall statistical analysis was performed using the four LTM wells with regular data collection. Results indicate stable or probably decreasing concentrations.

Un-ionized ammonia (NH₃) is the more toxic component of total ammonia as it volatilizes more readily than ionized ammonia (NH₄⁺); impacting the inhalation exposure pathway. The University of Florida calculated an alternative GCTL (AGCTL) for un-ionized ammonia in 2015. The calculated May 2022 un-ionized ammonia concentrations were below the AGCTL of 210 µg/L. That result prompted a review of SSPF historical results using FDEP's un-ionized ammonia calculator v. 1.2.

An un-ionized ammonia (NH₃) concentration was calculated for the two most recent sampling events, if available, for each monitoring well using the total ammonia concentration, pH, temperature, and salinity. Monitoring wells SSPF-MW0007 through SSPF-MW0012, SSPFMW0015, and SSPF-MW0019 were only sampled once during the RFI; therefore, only one unionized ammonia concentration was calculated for these monitoring wells. Salinity was not measured at the site prior to 2022; therefore, an average salinity measurement was used for each un-ionized ammonia calculation without an applicable salinity measurement. The average salinity measurement of 0.35 standard units (S.U.) was calculated using the salinity measurements for monitoring wells SSPF-MW0004, SSPF-MW0006, SSPFMW0013, SSPF-MW0014, and SSPF-MW0016 recorded during the most recent sampling event in 2022.

The total ammonia concentrations are stable at SSPF. Total ammonia results are typically above 2x KSC background (3,760 µg/L) and the GCTL (2,800 µg/L). All total ammonia results for the LTM period are below NADC (28,000 µg/L). The calculated un-ionized ammonia concentrations are below the AGCTL (210 µg/L) for the entire period of LTM, except for the single SSPF-MW0019 sample with an anomalous pH. The MW0019 total ammonia result was below the total ammonia GCTL. The AGCTL for un-ionized ammonia is protective of human health and the environment. A

recommendation is made to adopt the ammonia AGCTL as the cleanup objective for SSPF groundwater.

If approved, a Notice of Intent to Use AGCTL would be made in accordance with 62-780.220(7), Florida Administrative Code. Prior to the Department's approval of institutional controls, institutional and engineering controls, or alternative CTLs, the Party Responsible for Site Rehabilitation (NASA) is required to mail notice of the Department's intent for such approval to:

1. the local government(s) with jurisdiction over the property(ies) subject to the institutional or engineering control,
2. to real property owner(s) of any property subject to the institutional or engineering control,
3. to any resident or business tenant and,
4. to any party holding a materially affected encumbrance in the area subject to the controls.

With FDEP, NASA will identify those parties who should be notified. Publication of notice may be sufficient. In addition, the SB for this site will be revised.

FDEP inquired why the pH was high at MW0019? Deda replied that, in its report, Geosyntec thought there was grout in the well. We can relocate the well and sample if you like. FDEP stated this was not necessary. FDEP will discuss the potential use of the AGCTL internally. NASA took an action item to follow up with FDEP on this **(2404-A01)**.

FDEP inquired when was the last groundwater LTM at this site? AECOM clarified that the last LTM event was in 2022 under the KSC Industrial Area program.

FDEP inquired why NASA would request No Further Action and not a site Rehabilitation Completion Order? NASA stated that there continues to be ammonia used under our KSC air permit and that closure may not be appropriate until use of ammonia ceases at this site. The consensus items were not tested at this time. NASA will follow up with FDEP post-meeting.

Results: Action Item 2404-A01

APPENDIX B

DAILY FIELD ACTIVITY LOGS

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MAY 2023 GROUNDWATER SAMPLING EVENT

DRY SEASON

KARS PARK 1 and LETF

5/26/23

KSC-IA LTM

GK

May 2023 LTM Sampling.

Project # 60610905

Vehicle: AECOM F-150 # 275

PPE: Level D + Nitrile gloves + muck boots

0750 Greg Kusel and Dustin Slater onsite
at LARS park 1.

0815 open wells and gauge water levels.

* See gauging sheets *

1007 Complete water level gauging.

1010 begin purging at KPI-MW0022.

1027 Collect KPI-MW0022-007.0-20230526.

1035 Drive to LETF.

1055 Sign in at LETF.

1100 open wells and gauge water levels.

* See gauging sheet *

1139 Complete water level gauging.

1140 begin purging LETF-MW0001.

1157 Collect LETF-MW0001-025.0-20230526

1107 begin purging LETF-PSB-MW0001I-024.5-
20230526.

1244 Collect LETF-PSB-MW0001I-024.5-20230526.

1250 Sign out of LETF and drive to the UCF.

1310 Collect IDW Samples.

Drum # 229814 Container # 229674

10% Fall pH: 6.58

1400 GK + DS off site.

Launch Equipment Testing Facility

Well Gauging May 2023

Well ID	Screen Interval		Sampling	Time Opened	Time Gauged	DTW (ft btoc)	Well Dia. (in)	Notes
LETF-MW0001	22.5	27.5	x	1125	1133	6.00	1	
LETF-MW0002	22.5	27.5		1124	1138	5.88	1	
LETF-MW0003	22.5	27.5		1126	1135	5.83	1	
LETF-MW0004	33.5	38.5		1125	1132	5.97	1	
LETF-MW0005	22.5	27.5		1119	1122	6.13	1	
LETF-MW0006	33.5	38.5		1103	1106	3.17	1	
LETF-MW0007	33.5	38.5		1126	1134	5.83	1	
LETF-MW0008	22.5	27.5		1130	1139	5.53	1	
LETF-MW0009	22.5	27.5		1128	1137	5.81	1	
LETF-MW0010	22.5	27.5		1127	1136	6.06	1	
LETF-MW0011	22.5	27.5		1111	1114	5.10	1	
LETF-PSB-MW0001I	22	27	x	1110	1113	5.27	1	
LETF-PSB-MW0002I	22	27		1104	1107	3.16	1	
LETF-PSB-MW0003I	20	25		1102	1105	3.68	1	

KARS Park 1

Well Gauging May 2023

Well ID	Screen Interval		Sampling	Time Opened	Time Gauged	DTW (ft btoc)	Well Dia. (in)	Notes
MW0001	2	12		0850	0853	3.19	1	
MW0003	2	12		0817	0818	> TOC	1	above TOC
MW0004	2	12		0901	0904	3.39	1	3.39
MW0005	2	12		0815	0816	> TOC	1	above TOC
MW0015	2	12		0855	0858	3.27	1	
MW0016	2	12		0820	0823	1.81	1	
MW0017	2	12					1	DESTROYED
MW0019	2	12		0939	0943	1.22	1	
MW0022	2	12	x	0945	0947	1.19	1	
MW0023	2	12		0838	0841	3.20	1	
MW0024	2	12		1003	1007	1.84	1	
MW0027	2	12		0843	0845	3.74	1	
MW0028	2	12		0957	1000	0.10	2	
MW0035	2	12		0926	0928	0.61	1	
MW0036	2	12		0919	0923	0.65	1	NO COVER
MW0037	2	12		0906	0908	3.49	1	

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Field Instrument Calibration Records

INSTRUMENT

HACH 2100P # 3

Serial # 26230

PARAMETER: *Turbidity*

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A GELEX 0-10 NTU (+/- 10%)

Standard B GELEX 10-100 NTU (+/- 6.5%)

Standard C GELEX 100-1000 NTU (+/- 5%)

DATE (mm/dd/yy)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
5/26/23	0742	A	20	19.97		NO	INITIAL	DS
"	"	B	100	99.2		"	"	"
"	"	C	800	798		"	"	"
		A				NO		
"	"	B				"	"	"
"	"	C				"	"	"
		A				NO		
		B				"		
		C				"		
		A				NO		
		B				"		
		C				"		
		A				NO		
		B				"		
		C				"		
		A				NO		
		B				"		
		C				"		

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Form FD9000-8 CALIBRATION LOG (FDEP SOP FT 1000-FT 1500, FD 1000-FD 4000) 11-10-05

Project/Site: KSC IA LTM Date: 5/26/23 Meter # 22H 104 809

Temperatures (Quarterly) For Date of Last Temperature Verification see in log book

Disolved Oxygen	DEP SOP FT 1500	Initials	Date	Time	Probe Charge	Probe Gain	mg/L	Temp °C	% DO	Saturation mg/L	Pass or Fail
<u>Ⓞ</u> CAL		<u>DS</u>	<u>5/26/23</u>	<u>0745</u>			<u>8.7M</u>	<u>22.0*</u>	<u>100%</u>	<u>8.7M</u>	<u>P</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>

Specific Conductance	DEP SOP FT 1200	Initials	Date	Time	Standard μ mhos/cm	Exp. Date	Lot #	Bottle #	Cell Constant	Reading μ mhos/cm	Pass or Fail
<u>Ⓞ</u> CAL		<u>DS</u>	<u>5/26/23</u>	<u>0745</u>	<u>1413</u>	<u>12/23</u>	<u>221215C</u>			<u>1413</u>	<u>P</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>

pH	DEP SOP FT 1100	Initials	Date	Time	Standard SU	Exp. Date	Lot #	Bottle #	Slope	Reading SU	Pass or Fail
<u>Ⓞ</u> CAL		<u>DS</u>	<u>5/26/23</u>	<u>0745</u>	<u>7.00</u>	<u>4/24</u>	<u>220922A</u>			<u>7.00</u>	<u>P</u>
ICV					<u>4.00</u>	<u>6/24</u>	<u>221215A</u>			<u>7.00</u>	<u>F</u>
CCV					<u>10.00</u>	<u>6/24</u>	<u>221215B</u>			<u>10.00</u>	<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>
CAL											<u>F</u>
ICV											<u>F</u>
CCV											<u>F</u>

Maintenance: Weekly pH Slope: _____ Specific Conductance Probe Cleaned? Yes No Dissolved Oxygen Membrane Changed: Yes No

Notes: Ⓞ DS 5/26/23 0745 238 6/23 2G1784 238.0 Ⓞ

029

Ⓞ

Perform only in Calibrate Mode:
Perform only in Run Mode:
Perform only in Run Mode:

CAL - Calibrate -
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

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NOVEMBER 2023 GROUNDWATER SAMPLING EVENT

WET SEASON

GSSP and FSA1

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11/6/23 KSC - IA LTM GK DS

Project # 60610905

Personnel: Greg Kusel and Dustin Slater.

PPE: Level D + Nitrile gloves

0700 GK + DS at AECOM Depot

to pack Field trucks

(AECOM F-150's #403, 275)

0830 arrive at GSSP, organize paperwork

0900 Begin opening wells and gauging
water levels (recorded digitally)

1100 Calibrate equipment and begin
sampling select wells
(recorded digitally).

1530 Drive to CCF to unload IDW.

1550 unload IDW into drum.

1615 GK + DS offsite.

~~11/6/23
GK~~

pg. 1 of 2

11/7/23 KSC - IA LTM GK + DS

0800 GK + DS meet at KSC budgeting
office. Drive to FSAI

0830 Check in at FSAI office.

0845 open monitoring wells.

0905 Calibrate equipment.

0915 measure water levels.

0940 Begin sampling select wells.

(water levels and GW sample logs)
(recorded digitally)

1230 Check out of FSAI and drive
to CCF to drop off IDW.

1300 unload IDW and sample drum.

Drum # 228469

pallet # 220341

% Full: 60%

pH: 7.46

1310 Collect IA-IDW01-20231107

1320 organize sample coolers.

1330 GK + DS offsite. DS to drop
off samples at Eurofins.

~~11/7/23
GK~~

pg. 2 of 2

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General Services Administration Seize

Well Gauging November 2023

Well ID	Screen Interval		Sampling	DTW (ft)	DTB (ft)	Well Dia. (in)
GSSP-MW0006	5	15		5.33		
GSSP-MW0007	25	35		5.30		
GSSP-MW0008	5	15		2.86		
GSSP-MW0009	25	35		3.53		
GSSP-MW00013	5	15	x	2.99		
GSSP-MW00014	25	35		2.87		
GSSP-MW00019	15	25	x	3.95		
GSSP-MW00020	25	35	x	4.09		
GSSP-MW00021	40	50		3.74		
GSSP-MW00022	15	25		2.64		
GSSP-MW00023	25	35		2.58		
GSSP-MW00024R	15	25	x	2.41		
GSSP-MW00026	5	15		3.53		
GSSP-MW00027	5	15		3.29		
GSSP-MW00034	5	15	x	6.38		
GSSP-MW00035	15	25	x	6.30		
GSSP-MW00036	30	40	x	6.35		
GSSP-MW00039	25	35		6.90		
GSSP-MW00042	30	40		5.78		
GSSP-MW00043R	5	15		4.60		
GSSP-MW00044R	25	35	x	4.67		
GSSP-MW00045	15	25		5.35		
GSSP-MW00047	15	25		3.50		
GSSP-MW00049	55	60		4.60		
GSSP-MW00053	15	25	x	3.88		
GSSP-MW00054	25	35		3.81		
GSSP-MW00055	5	15		3.03		
GSSP-MW00058	10	15		4.45		
GSSP-MW00059	16	21	x	4.86		
GSSP-MW00060	10	15	x	4.92		
GSSP-MW00061	16	21	x	5.08		
GSSP-MW00062	10	15	x	3.82		
GSSP-MW00063	16	21	x	3.83		

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Fuel Storage Area

Well Gauging November 2023

Well ID	Screen Interval		Sampling	DTW (ft)	DTB (ft)	Well
FSA1-MW0001	2	12	x	4.30		
FSA1-MW0002	2	12	x	3.60		
FSA1-MW0004	2	12		4.39		
FSA1-MW0012R	3	13	x	4.57		
FSA1-MW0014	2	12	x	4.74		
FSA1-MW0015	3	13		3.39		
FSA1-MW0016A	3	13		4.70		
FSA1-MW0017A	3	13	x	4.60		
FSA1-MW0019	2	12		6.68		
FSA1-MW0020	1	11		3.80		
FSA1-MW0021	2	12	x	3.45		
FSA1-MW0022R	2 3	GK 12 13	x	4.90		
FSA1-MW0023	2	12	x	4.33		
FSA1-MW0024	2	12		3.98		
FSA1-MW0025	15	25		3.43		
FSA1-MW0026	15	25		4.83		
FSA1-MW0027	15	25	x	5.11		
FSA1-MW0028	15	25	x	4.88		

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Calibration Report

Instrument Aqua TROLL 600
Serial Number 1017812
Created 11/6/2023

Sensor Conductivity

Serial Number 929293
Last Calibrated 11/6/2023

Calibration Details

TDS Conversion Factor (ppm) 0.65
Cell Constant 0.999
Reference Temperature 25.00 °C

Pre Measurement

Actual Conductivity 8,133.6 $\mu\text{S}/\text{cm}$
Specific Conductivity 7,917.4 $\mu\text{S}/\text{cm}$

Post Measurement

Actual Conductivity 8,218.5 $\mu\text{S}/\text{cm}$
Specific Conductivity 8,000.0 $\mu\text{S}/\text{cm}$

Sensor Turbidity

Serial Number 780503
Last Calibrated 10/26/2023

Calibration Details

Slope 1
Offset -15.89 NTU

Calibration Point 1

Pre Measurement 2.35 NTU
Post Measurement 2.00 NTU

Sensor RDO

Serial Number 1003301
Last Calibrated 11/6/2023

Calibration Details

Slope 1.099654
Offset 0.00 mg/L

Calibration point 100%

Concentration 7.46 mg/L
Pre Measurement 94.62 %Sat
Post Measurement 100.00 %Sat
Temperature 25.77 °C

Barometric Pressure 1,020.0 mbar

Sensor	pH/ORP
Serial Number	982898
Last Calibrated	11/6/2023

Calibration Details

Calibration Point 1

pH of Buffer	6.98 pH
pH mV	-12.5 mV
Temperature	26.43 °C

Pre Measurement

pH	6.98 pH
pH mV	-12.5 mV

Post Measurement

pH	6.98 pH
pH mV	-12.6 mV

Slope and Offset 1

Slope	-59.44 mV/pH
Offset	-13.7 mV

ORP

ORP Solution	Quick Cal
Offset	23.1 mV
Temperature	26.43 °C
Pre Measurement	122.6 mV
Post Measurement	221.4 mV

Sensor	Barometric Pressure
Serial Number	1017812
Last Calibrated	Factory Defaults

Calibration Report

Instrument Aqua TROLL 600
Serial Number 1017812
Created 11/7/2023

Sensor Conductivity

Serial Number 929293
Last Calibrated 11/7/2023

Calibration Details

TDS Conversion Factor (ppm) 0.65
Cell Constant 0.976
Reference Temperature 25.00 °C

Pre Measurement

Actual Conductivity 7,432.2 µS/cm
Specific Conductivity 8,188.8 µS/cm

Post Measurement

Actual Conductivity 7,260.8 µS/cm
Specific Conductivity 8,000.0 µS/cm

Sensor Turbidity

Serial Number 780503
Last Calibrated 10/26/2023

Calibration Details

Slope 1
Offset -15.89 NTU

Calibration Point 1

Pre Measurement 2.35 NTU
Post Measurement 2.00 NTU

Sensor RDO

Serial Number 1003301
Last Calibrated 11/7/2023

Calibration Details

Slope 1.045362
Offset 0.00 mg/L

Calibration point 100%

Concentration 8.55 mg/L
Pre Measurement 105.15 %Sat
Post Measurement 100.00 %Sat
Temperature 21.28 °C

Barometric Pressure 1,021.6 mbar

Sensor	pH/ORP
Serial Number	982898
Last Calibrated	11/7/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-12.9 mV
Temperature	20.16 °C

Pre Measurement

pH	6.99 pH
pH mV	-12.8 mV

Post Measurement

pH	7.00 pH
pH mV	-12.7 mV

Slope and Offset 1

Slope	-58.2 mV/pH
Offset	-12.9 mV

ORP

ORP Solution	Quick Cal
Offset	-79.5 mV
Temperature	20.16 °C
Pre Measurement	338.7 mV
Post Measurement	230.8 mV

Sensor	Barometric Pressure
Serial Number	1017812
Last Calibrated	Factory Defaults

FIELD INSTRUMENT CALIBRATION RECORDS - CALIBRATION LOG - PAP

Project Site/FacID: KSC IA LTM

Calibrated by (Print)/Affiliation: Dustin Slater / AECOM

Boldly "X" this box if there is qualified data on this page.

TURBIDITY (REFERENCE: DEP SOP FT 1600)

Meter/Instrument Name and Unique ID: Oakton T100IR 1120531032

			Std=0.1-10 NTU +/-10%	Std=11-40 NTU +/-8%	Std=41-100 NTU +/-6.5%	Std>100 NTU +/-5%						
CAL	ICV	CCV	Initials	Date	Time	Standard (NTU)	Exp. Date	Lot #	Response (NTU)	Deviation (%)	Pass or Fail	
CAL	EV	CCV	DS	11/6/23	1101	20	+	-	19.98	-10%	B	F
CAL	EV	CCV	↓	↓	↓	100	-	-	99.5	-150%	⊙	F
CAL	ICV	CCV	↓	↓	↓	800	-	-	793	-88%	B	F
CAL	ICV	EV	DS	11/7/23	0901	20	-	-	19.97	-15%	B	F
CAL	ICV	EV	↓	↓	↓	100	-	-	99.7	-30%	⊙	F
CAL	ICV	EV	↓	↓	↓	800	-	-	795	-63%	⊙	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F

pH (REFERENCE: DEP SOP FT 1100)

Acceptance Criteria +/-0.2 SU

Meter/Instrument Name and Unique ID: YSI Pro Quatro S/N 22A104809

CAL	ICV	CCV	Initials	Date	Time	Standard (SU)	Exp. Date	Lot #	Response (SU)	Deviation (SU)	Pass or Fail	
CAL	ICV	CCV	DS	11/6/23	1103	7.00	6/24	220922A	7.00	⊙ 7.00	B	F
CAL	ICV	CCV	↓	↓	↓	4.00	6/24	221215A	4.00	⊙ 4.00	⊙	F
CAL	ICV	CCV	↓	↓	↓	10.00	6/24	221215B	10.00	-	⊙	F
CAL	ICV	CCV	DS	11/7/23	0903	7.00	↓	↓	7.09	+0.09	B	F
CAL	ICV	CCV	↓	↓	↓	4.00	↓	↓	3.92	-0.08	⊙	F
CAL	ICV	CCV	↓	↓	↓	10.00	↓	↓	9.96	-0.04	⊙	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F
CAL	ICV	CCV									P	F

Perform ICVs and CCVs only in "READ/RUN" mode.

CAL - Calibration; ICV - Initial Calibration Verification; and, CCV - Continuing Calibration Verification.

Deviation (%) = 100 - ((Response/Standard)*100)

FIELD INSTRUMENT CALIBRATION RECORDS - CALIBRATION LOG ~~RRP~~

Project Site/FacID: RSC IA LTM

Calibrated by (Print)/Affiliation: Dustin Slater / AECOM

Boxed area: Boldly "X" this box if there is qualified data on this page.

Temperature (Quarterly) _____ Date of Last Temp Verification: _____ See log book: _____

DISSOLVED OXYGEN (DO) (REFERENCE: DEP SOP FT 1500)						Acceptance Criteria +/-0.3 mg DO/L						
Meter/Instrument Name and Unique ID: <u>YSI Pro Quatro S/N 22H104809</u>												
CAL	ICV	CCV	Initials	Date	Time	Standard (DO %)	Temp °C	DO Saturation mg/L (100%)**	Response DO (%)	Response mg DO/L	Deviation mg DO/L	Pass or Fail
<input checked="" type="checkbox"/>	ICV	CCV	DS	11/6/23	1111	100%	21.8°	8.418	100.4%	8.42	-	<input checked="" type="checkbox"/> F
<input checked="" type="checkbox"/>	ICV	CCV	DS	11/7/23	0911	100%	21.6°	8.812	102.5%	8.97	-0.16	<input checked="" type="checkbox"/> F
CAL	ICV	CCV				100%						P F
CAL	ICV	CCV				100%						P F
CAL	ICV	CCV				100%						P F
CAL	ICV	CCV				100%						P F

** See Table FS 2200-2 and/or Table FT 1500-1 for Dissolved Oxygen 100% Saturation (mg/L) corresponding to Temperature.

SPECIFIC CONDUCTANCE (REFERENCE: DEP SOP FT 1200)						Acceptance Criteria +/-5% the standard						
Meter/Instrument Name and Unique ID: <u>YSI Pro Quatro S/N 22H104809</u>												
CAL	ICV	CCV	Initials	Date	Time	Standard (µmho/cm)	Exp. Date	Lot #	Response (µmho/cm)	Deviation (%)	Pass or Fail	
<input checked="" type="checkbox"/>	ICV	CCV	DS	11/6/23	1109	100	12/23	221215D	100	-	<input checked="" type="checkbox"/> F	
<input checked="" type="checkbox"/>	ICV	CCV	↓	↓	"	1413	12/23	221215C	1413	-	<input checked="" type="checkbox"/> F	
CAL	ICV	CCV	DS	11/7/23	0908	100	↓	↓	101.3	+1.3%	<input checked="" type="checkbox"/> F	
CAL	ICV	CCV	↓	↓	"	1413	↓	↓	1405	-0.5%	<input checked="" type="checkbox"/> F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	

OXIDATION-REDUCTION POTENTIAL (ORP)						Acceptance Criteria +/-10 mV						
REFERENCE: EPA Region 4, Operating Procedure, Field Measurement of Oxidation-Reduction Potential (ORP)												
Meter/Instrument Name and Unique ID: <u>YSI Pro Quatro S/N 22H104809</u>												
CAL	ICV	CCV	Initials	Date	Time	Standard (mV)	Exp. Date	Lot #	Response (mV)	Deviation (mV)	Pass or Fail	
<input checked="" type="checkbox"/>	ICV	CCV	DS	11/6/23	1106	238	3/26	21C100633	238.0	-	<input checked="" type="checkbox"/> F	
CAL	ICV	CCV	DS	11/7/23	0906	238	4	"	232.2	-5.8	<input checked="" type="checkbox"/> F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	
CAL	ICV	CCV									P F	

Perform ICVs and CCVs only in "READ/RUN" mode.

CAL - Calibration; ICV - Initial Calibration Verification; and, CCV - Continuing Calibration Verification.

Deviation (%) = 100 - ((Response/Standard)*100)

APPENDIX C
GROUNDWATER SAMPLING LOGS

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GROUNDWATER SAMPLE LOG SHEET **AECOM**

Event: Industrial Area Groundwater Sampling
 Site Name: Kennedy Athletic Recreation and Social (KARS) Park 1 (SWMU 084)
 Project #: 60610905

Sample ID: KP1-MW0022-007.0-20230526 Sampler: Dustin Slater
 Well ID: KP1-MW0022 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	1.84 FT
Top of Screen (ft-BTOC):	2.0000	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	12.0000	Purge/Sample Method:	
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Lead

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	S.C. (US/CM)	DO (MG/L)	Turbidity (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
10:10 AM			0	1.84								Clear	None
10:20 AM	0.05	0.5	0.5	2.05	6.41	1997	0.38	3.85	26.5	-115.5	0.98	Yellow	None
10:22 AM	0.05	0.1	0.6	2.05	6.4	2002	0.37	1.5	26.4	-118.7	0.99	Yellow	None
10:24 AM	0.05	0.1	0.7	2.05	6.4	2006	0.39	1.55	26.4	-120.3	0.99	Yellow	None
10:26 AM	0.05	0.1	0.8	2.05	6.4	2007	0.38	1.06	26.5	-121.9	0.99	Yellow	None

Start Purge:	5/26/2023 10:10:00 AM	End Purge:	5/26/2023 10:26:00 AM	Total Volume (gal):	0.8
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GROUNDWATER SAMPLE LOG SHEET **AECOM**

Event: Industrial Area Groundwater Sampling
 Site Name: Launch Equipment Test Facility/M7-505 Area (SWMU 091)
 Project #: 60610905

Sample ID: LETF-MW0001-025.0-20230526 Sampler: Dustin Slater
 Well ID: LETF-MW0001 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	6.00 FT
Top of Screen (ft-BTOC):	22.5000	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	27.5000	Purge/Sample Method:	
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	S.C. (US/CM)	DO (MG/L)	Turbidity (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:40 AM			0	6								Clear	None
11:50 AM	0.05	0.5	0.5	6.2	6.49	2249	0.13	5.69	27.8	-126.1	1.09	Yellow	None
11:52 AM	0.05	0.1	0.6	6.2	6.49	2254	0.12	4.1	27.9	-124.7	1.09	Yellow	None
11:54 AM	0.05	0.1	0.7	6.2	6.5	2252	0.11	2.84	27.8	-123.4	1.09	Yellow	None
11:56 AM	0.05	0.1	0.8	6.2	6.47	2250	0.08	2.4	27.7	-124.3	1.09	Yellow	None

Start Purge:	5/26/2023 11:40:00 AM	End Purge:	5/26/2023 11:56:00 AM	Total Volume (gal):	0.8
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GROUNDWATER SAMPLE LOG SHEET **AECOM**

Event: Industrial Area Groundwater Sampling
 Site Name: Launch Equipment Test Facility/M7-505 Area (SWMU 091)
 Project #: 60610905

Sample ID: LETF-PSB-MW0001I-024.5-20230526 Sampler: Dustin Slater
 Well ID: LETF-PSB-MW0001I Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	5.27 FT
Top of Screen (ft-BTOC):	20.0000	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	25.0000	Purge/Sample Method:	
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	S.C. (US/CM)	DO (MG/L)	Turbidity (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
12:07 PM			0	5.27								Clear	None
12:17 PM	0.05	0.5	0.5					74.4				Clear	None
12:27 PM		0.5	1					34.7				Clear	None
12:37 PM	0.05	0.5	1.5	5.69	6.42	2706	0.03	14.9	29.2	-128.2	1.29	Yellow	None
12:39 PM	0.05	0.1	1.6	5.69	6.43	2723	0.03	19.1	29.1	-129.2	1.28	Yellow	None
12:41 PM	0.05	0.1	1.7	5.69	6.43	2721	0.03	15.6	29.3	-129.7	1.29	Yellow	None
12:43 PM	0.05	0.1	1.8	5.69	6.43	2746	0.03	14.9	29.3	-130.9	1.29	Yellow	None

Start Purge:	5/26/2023 12:07:00 PM	End Purge:	5/26/2023 12:43:00 PM	Total Volume (gal):	1.8
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0013-010.0-20231106 Sample Date: 11/6/2023 3:24:00 PM
 Well ID: GSSP-MW0013 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	2.99
Top of Screen (ft-BTOC):	5.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	15.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
2:56 PM			0	2.99								Clear	None
3:17 PM	0.05	1	1	3.13	6.99	555	0.16	1.94	25.1	-138.4	0.27	Clear	None
3:19 PM	0.05	0.1	1.1	3.13	6.98	555	0.15	1.7	25.2	-139.4	0.27	Clear	None
3:21 PM	0.05	0.1	1.2	3.13	7.03	557	0.15	1.52	25.1	-139.8	0.27	Clear	None
3:23 PM	0.05	0.1	1.3	3.13	7.04	558	0.14	1.23	25.1	-40.6	0.27	Clear	None

Start Purge:	11/6/2023 2:56:00 PM	End Purge:	11/6/2023 3:23:00 PM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0019-020.0-20231106 Sample Date: 11/6/2023 11:49:00 AM
 Well ID: GSSP-MW0019 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	3.95
Top of Screen (ft-BTOC):	15.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	25.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:32 AM			0	3.95								Clear	None
11:42 AM	0.1	1	1	3.97	6.77	832.9	0.2	0	26.28	-96.4	0.41	Clear	None
11:44 AM	0.1	0.2	1.2	3.97	6.77	832.8	0.2	0	26.23	-97.3	0.41	Clear	None
11:46 AM	0.1	0.2	1.4	3.97	6.77	833.7	0.17	0	26.2	-100.5	0.41	Clear	None
11:48 AM	0.1	0.2	1.6	3.97	6.77	833.9	0.17	1.45	26.21	-103.4	0.41	Clear	None

Start Purge:	11/6/2023 11:32:00 AM	End Purge:	11/6/2023 11:48:00 AM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0020-030.0-20231106 Sample Date: 11/6/2023 12:13:00 PM
 Well ID: GSSP-MW0020 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.00
Top of Screen (ft-BTOC):	25.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	35.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:56 AM			0	4								Clear	None
12:06 PM	0.1	1	1	4.02	6.78	869.9	0.29	0	25.93	-105.5	0.43	Clear	None
12:08 PM	0.1	0.2	1.2	4.02	6.79	869.6	0.25	0	25.88	-107.5	0.43	Clear	None
12:10 PM	0.1	0.2	1.4	4.02	6.79	869.5	0.23	0	25.88	-108.2	0.43	Clear	None
12:12 PM	0.1	0.2	1.6	4.02	6.79	870.1	0.23	1.03	25.87	-108.8	0.43	Clear	None

Start Purge:	11/6/2023 11:56:00 AM	End Purge:	11/6/2023 12:12:00 PM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0024R-020.0-20231106 Sample Date: 11/6/2023 1:28:00 PM
 Well ID: GSSP-MW0024R Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	2.41
Top of Screen (ft-BTOC):	15.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	25.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
1:11 PM			0	2.41								Clear	None
1:21 PM	0.1	1	1	2.43	6.67	749.1	0.28	0	25.63	-106.5	0.37	Clear	None
1:23 PM	0.1	0.2	1.2	2.43	6.68	748.1	0.3	0	25.59	-106.9	0.37	Clear	None
1:25 PM	0.1	0.2	1.4	2.43	6.68	748.4	0.27	0	25.58	-108.8	0.37	Clear	None
1:27 PM	0.1	0.2	1.6	2.43	6.68	749	0.25	0.96	25.57	-112.1	0.37	Clear	None

Start Purge:	11/6/2023 1:11:00 PM	End Purge:	11/6/2023 1:27:00 PM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0034-007.0-20231106 Sample Date: 11/6/2023 3:01:00 PM
 Well ID: GSSP-MW0034 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	6.38
Top of Screen (ft-BTOC):	5.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	15.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
2:44 PM			0	6.38								Clear	None
2:54 PM	0.1	1	1	6.41	6.23	451.4	0.21	0	24.2	-115.2	0.22	Clear	None
2:56 PM	0.1	0.2	1.2	6.41	6.24	461.6	0.2	0	24.13	-122.7	0.22	Clear	None
2:58 PM	0.1	0.2	1.4	6.41	6.27	476.6	0.18	0	24.11	-129.3	0.23	Clear	None
3:00 PM	0.1	0.2	1.6	6.41	6.27	480	0.17	0.5	24.1	-134.6	0.23	Clear	None

Start Purge:	11/6/2023 2:44:00 PM	End Purge:	11/6/2023 3:00:00 PM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0035-020.0-20231106 Sample Date: 11/6/2023 2:35:00 PM
 Well ID: GSSP-MW0035 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	6.30
Top of Screen (ft-BTOC):	15.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	25.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
2:18 PM			0	6.3								Clear	None
2:28 PM	0.1	1	1	6.32	6.82	823.8	0.27	0	23.6	-99.5	0.41	Clear	None
2:30 PM	0.1	0.2	1.2	6.32	6.82	823	0.27	0	23.55	-101	0.41	Clear	None
2:32 PM	0.1	0.2	1.4	6.32	6.82	822.8	0.23	0	23.55	-104	0.41	Clear	None
2:34 PM	0.1	0.2	1.6	6.32	6.83	822.2	0.26	0.44	23.49	-105.3	0.41	Clear	None

Start Purge:	11/6/2023 2:18:00 PM	End Purge:	11/6/2023 2:34:00 PM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0036-035.0-20231106 Sample Date: 11/6/2023 2:12:00 PM
 Well ID: GSSP-MW0036 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	6.35
Top of Screen (ft-BTOC):	30.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	40.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
1:55 PM			0	6.35								Clear	None
2:05 PM	0.1	1	1	6.37	6.8	1144.2	0.31	0	23.42	-86	0.58	Clear	None
2:07 PM	0.1	0.2	1.2	6.37	6.81	1151.8	0.28	0	23.44	-88.4	0.58	Clear	None
2:09 PM	0.1	0.2	1.4	6.37	6.81	1150.5	0.26	0	23.4	-89.5	0.58	Clear	None
2:11 PM	0.1	0.2	1.6	6.37	6.82	1154.6	0.25	0.68	23.33	-91	0.58	Clear	None

Start Purge:	11/6/2023 1:55:00 PM	End Purge:	11/6/2023 2:11:00 PM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0044R-030.0-20231106 Sample Date: 11/6/2023 11:40:00 AM
 Well ID: GSSP-MW0044R Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.67
Top of Screen (ft-BTOC):	25.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	35.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:13 AM			0	4.67								Clear	None
11:33 AM	0.05	1	1	4.78	7.07	702	0.55	7.47	28.1	-54.9	0.32	Yellow	None
11:35 AM	0.05	0.1	1.1	4.78	7.11	705	0.54	6.74	28	-55.5	0.32	Yellow	None
11:37 AM	0.05	0.1	1.2	4.78	7.14	705	0.51	6.34	28	-56	0.32	Yellow	None
11:39 AM	0.05	0.1	1.3	4.78	7.16	708	0.5	5.87	28	-57.4	0.33	Yellow	None

Start Purge:	11/6/2023 11:13:00 AM	End Purge:	11/6/2023 11:39:00 AM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0053-020.0-20231106 Sample Date: 11/6/2023 12:53:00 PM
 Well ID: GSSP-MW0053 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	3.88
Top of Screen (ft-BTOC):	15.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	25.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
12:36 PM			0	3.88								Clear	None
12:46 PM	0.1	1	1	3.91	6.86	937.9	0.36	31.03	26.82	-94.8	0.47	Clear	None
12:48 PM	0.1	0.2	1.2	3.91	6.85	937.9	0.35	69.1	26.75	-97	0.47	Clear	None
12:50 PM	0.1	0.2	1.4	3.91	6.85	937.4	0.31	127.16	26.77	-98.6	0.47	Clear	None
12:52 PM	0.1	0.2	1.6	3.91	6.85	937.1	0.3	179.01	26.74	-100.1	0.47	Clear	None

Start Purge:	11/6/2023 12:36:00 PM	End Purge:	11/6/2023 12:52:00 PM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0059-018.0-20231106 Sample Date: 11/6/2023 2:51:00 PM
 Well ID: GSSP-MW0059 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.86
Top of Screen (ft-BTOC):	16.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	21.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
2:24 PM			0	4.86								Clear	None
2:44 PM	0.05	1	1	4.94	7.41	911	0.31	1.91	26.6	-156	0.43	Clear	None
2:46 PM	0.05	0.1	1.1	4.94	7.41	909	0.35	1.65	26.5	-155.8	0.43	Clear	None
2:48 PM	0.05	0.1	1.2	4.94	7.4	908	0.31	1.39	26.4	-157	0.43	Clear	None
2:50 PM	0.05	0.1	1.3	4.94	7.41	907	0.27	1.19	26.4	-156	0.43	Clear	None

Start Purge:	11/6/2023 2:24:00 PM	End Purge:	11/6/2023 2:50:00 PM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0060-012.5-20231106 Sample Date: 11/6/2023 1:04:00 PM
 Well ID: GSSP-MW0060 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.92
Top of Screen (ft-BTOC):	10.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	15.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
12:37 PM			0	4.92								Clear	None
12:57 PM	0.05	1	1	5.01	7.11	565	0.38	6.76	27.5	-141.9	0.26	Clear	None
12:59 PM	0.05	0.1	1.1	5.01	7.13	567	0.34	6.12	27.5	-143.8	0.26	Clear	None
1:01 PM	0.05	0.1	1.2	5.01	7.13	567	0.33	5.45	27.5	-145.7	0.26	Clear	None
1:03 PM	0.05	0.1	1.3	5.01	7.14	569	0.33	5.32	27.5	-148	0.26	Clear	None

Start Purge:	11/6/2023 12:37:00 PM	End Purge:	11/6/2023 1:03:00 PM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0061-018.0-20231106 Sample Date: 11/6/2023 12:27:00 PM
 Well ID: GSSP-MW0061 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	5.08
Top of Screen (ft-BTOC):	16.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	21.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
12:00 PM			0	5.08								Clear	None
12:20 PM	0.05	1	1	5.14	7.64	880	0.48	4.38	26.6	-78.3	42	Clear	None
12:22 PM	0.05	0.1	1.1	5.14	7.66	878	0.47	3.92	26.6	-79.6	0.42	Clear	None
12:24 PM	0.05	0.1	1.2	5.14	7.7	879	0.45	8.27	26.6	-80.5	0.42	Clear	None
12:26 PM	0.05	0.1	1.3	5.14	7.71	878	0.43	7.65	26.6	-81.5	0.42	Clear	None

Start Purge:	11/6/2023 12:00:00 PM	End Purge:	11/6/2023 12:26:00 PM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0062-012.5-20231106 Sample Date: 11/6/2023 1:40:00 PM
 Well ID: GSSP-MW0062 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	3.82
Top of Screen (ft-BTOC):	10.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	15.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
1:13 PM			0	3.82								Clear	None
1:33 PM	0.05	1	1	3.97	7.44	630	0.23	6.68	26.9	-125.9	0.29	Clear	None
1:35 PM	0.05	0.1	1.1	3.97	7.45	629	0.23	6.21	26.9	-126.8	0.29	Clear	None
1:37 PM	0.05	0.1	1.2	3.97	7.45	629	0.22	5.97	27	-126.9	0.29	Clear	None
1:39 PM	0.05	0.1	1.3	3.97	7.45	628	0.22	5.67	26.9	-127.3	0.29	Clear	None

Start Purge:	11/6/2023 1:13:00 PM	End Purge:	11/6/2023 1:39:00 PM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: GSSP IA LTM Nov 2023
 Site Name: Industrial Area/General Services Administration Seized Property (SWMU 95)
 Project #: 60610905

Sample ID: GSSP-MW0063-018.0-20231106 Sample Date: 11/6/2023 2:16:00 PM
 Well ID: GSSP-MW0063 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	3.83
Top of Screen (ft-BTOC):	16.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	21.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
1:49 PM			0	3.83								Clear	None
2:09 PM	0.05	1	1	3.95	7.49	710	0.16	4.3	26.2	-86.9	0.34	Clear	None
2:11 PM	0.05	0.1	1.1	3.95	7.49	712	0.16	4.08	26.2	-86.5	0.32	Clear	None
2:13 PM	0.05	0.1	1.2	3.95	7.49	713	0.15	3.75	26.2	-87.2	0.32	Clear	None
2:15 PM	0.05	0.1	1.3	3.95	7.5	715	0.15	3.42	26.2	-87.6	0.32	Clear	None

Start Purge:	11/6/2023 1:49:00 PM	End Purge:	11/6/2023 2:15:00 PM	Total Volume (gal):	1.3
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
Project #: 60610905

Sample ID: FSA1-MW0001-005.0-20231107 **Sample Date:** 11/7/2023 11:14:00 AM
Well ID: FSA1-MW0001 **Sampler:** Dustin Slater
Location Type: Monitoring Well
Comments:

Well Information			
Well Diameter (in):	0.75	Static Water Level (ft-BTOC):	4.30
Top of Screen (ft-BTOC):	2.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	12.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
10:52 AM			0	4.3								Clear	None
11:07 AM	0.05	0.75	0.75	4.36	6.92	1101	0.56	4.38	29.1	-48.2	0.5	Clear	None
11:09 AM	0.05	0.1	0.85	4.36	6.93	1100	0.54	3.9	29.1	-48.3	0.5	Clear	None
11:11 AM	0.05	0.1	0.95	4.36	6.94	1099	0.53	5.19	29.1	-48.2	0.5	Clear	None
11:13 AM	0.05	0.1	1.05	4.36	6.97	1098	0.51	5.37	29.1	-48.3	0.5	Clear	None

Start Purge:	11/7/2023 10:52:00 AM	End Purge:	11/7/2023 11:13:00 AM	Total Volume (gal):	1.05
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0002-004.5-20231107 Sample Date: 11/7/2023 11:38:00 AM
 Well ID: FSA1-MW0002 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	0.75	Static Water Level (ft-BTOC):	3.60
Top of Screen (ft-BTOC):	2.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	12.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:16 AM			0	3.6								Clear	None
11:31 AM	0.05	0.75	0.75	3.67	7.09	788	0.29	5.9	27.1	-54.8	0.37	Clear	None
11:33 AM	0.05	0.1	0.85	3.67	7.08	786	0.26	6.74	27.1	-54.9	0.37	Clear	None
11:35 AM	0.05	0.1	0.95	3.67	7.07	785	0.25	5.63	27.1	-55.3	0.37	Clear	None
11:37 AM	0.05	0.1	1.05	3.67	7.05	785	0.24	6	27.1	-55.5	0.37	Clear	None

Start Purge:	11/7/2023 11:16:00 AM	End Purge:	11/7/2023 11:37:00 AM	Total Volume (gal):	1.05
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0012R-005.5-20231107 Sample Date: 11/7/2023 10:41:00 AM
 Well ID: FSA1-MW0012R Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.57
Top of Screen (ft-BTOC):	3.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	13.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
10:19 AM			0	4.57								Clear	None
10:34 AM	0.05	0.75	0.75	4.63	7.43	428.1	0.29	2.6	29.3	-44.1	0.19	Clear	None
10:36 AM	0.05	0.1	0.85	4.63	7.42	428.2	0.28	2.23	29.3	-48	0.19	Clear	None
10:38 AM	0.05	0.1	0.95	4.63	7.44	428.8	0.26	1.99	29.4	-52.3	0.19	Clear	None
10:40 AM	0.05	0.1	1.05	4.63	7.45	430.5	0.3	1.57	29.4	-54.5	0.19	Clear	None

Start Purge:	11/7/2023 10:19:00 AM	End Purge:	11/7/2023 10:40:00 AM	Total Volume (gal):	1.05
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0014-005.5-20231107 Sample Date: 11/7/2023 10:11:00 AM
 Well ID: FSA1-MW0014 Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	2	Static Water Level (ft-BTOC):	4.74
Top of Screen (ft-BTOC):	2.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	12.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
9:39 AM			0	4.74								Clear	None
10:04 AM	0.05	1.25	1.25	4.83	7.05	556	0.29	6.86	30	-49.9	0.24	Clear	None
10:06 AM	0.05	0.1	1.35	4.83	7.05	555	0.32	6.22	30	-48.9	0.24	Clear	None
10:08 AM	0.05	0.1	1.45	4.83	7.07	555	0.26	5.69	30	-477	0.24	Clear	None
10:10 AM	0.05	0.1	1.55	4.83	7.07	554	0.25	5.17	30	-47.1	0.24	Clear	None

Start Purge:	11/7/2023 9:39:00 AM	End Purge:	11/7/2023 10:10:00 AM	Total Volume (gal):	1.55
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0017A-005.5-20231107 Sample Date: 11/7/2023 12:19:00 PM
 Well ID: FSA1-MW0017A Sampler: Dustin Slater
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	2	Static Water Level (ft-BTOC):	4.60
Top of Screen (ft-BTOC):	3.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	13.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:43 AM			0	4.6								Clear	None
12:13 PM	0.05	1.5	1.5	4.68	6.94	804	0.14	6.09	28.6	-53.3	0.37	Clear	None
12:15 PM	0.05	0.1	1.6	4.68	6.95	804	0.15	6.32	28.7	-54.8	0.37	Clear	None
12:17 PM	0.05	0.1	1.7	4.68	6.98	804	0.15	5.76	28.7	-56.3	0.36	Clear	None
12:18 PM	0.05	0.1	1.8	4.68	7.02	803	0.14	5.21	28.7	-56.2	0.37	Clear	None

Start Purge:	11/7/2023 11:43:00 AM	End Purge:	11/7/2023 12:18:00 PM	Total Volume (gal):	1.8
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0021-004.0-20231107 Sample Date: 11/7/2023 12:00:00 PM
 Well ID: FSA1-MW0021 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	3.45
Top of Screen (ft-BTOC):	2.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	12.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:43 AM			0	3.45								Clear	None
11:53 AM	0.1	1	1	3.85	6.86	718.3	0.35	0	26.84	-208.4	0.35	Clear	None
11:55 AM	0.1	0.2	1.2	3.85	6.87	712.2	0.34	0	26.79	-208.3	0.35	Clear	None
11:57 AM	0.1	0.2	1.4	3.85	6.87	708.6	0.35	0	26.87	-208.2	0.35	Clear	None
11:59 AM	0.1	0.2	1.6	3.85	6.87	708	0.38	0.77	26.84	-208.1	0.35	Clear	None

Start Purge:	11/7/2023 11:43:00 AM	End Purge:	11/7/2023 11:59:00 AM	Total Volume (gal):	1.6
--------------	-----------------------	------------	-----------------------	---------------------	-----

GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0022R-005.5-20231107 Sample Date: 11/7/2023 10:59:00 AM
 Well ID: FSA1-MW0022R Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.90
Top of Screen (ft-BTOC):	3.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	13.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
10:42 AM			0	4.9								Clear	None
10:52 AM	0.1	1	1	4.93	7.15	588	1.92	0	27.1	-168	0.29	Clear	None
10:54 AM	0.1	0.2	1.2	4.93	7.16	620.9	2.15	0	27.09	-166.3	0.3	Clear	None
10:56 AM	0.1	0.2	1.4	4.93	7.16	466.1	2.12	0	27.1	-166.2	0.23	Clear	None
10:58 AM	0.1	0.2	1.6	4.93	7.17	480.2	2.2	0.52	27.11	-166.8	0.23	Clear	None

Start Purge:	11/7/2023 10:42:00 AM	End Purge:	11/7/2023 10:58:00 AM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0023-005.0-20231107 Sample Date: 11/7/2023 11:32:00 AM
 Well ID: FSA1-MW0023 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.33
Top of Screen (ft-BTOC):	2.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	12.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
11:15 AM			0	4.33								Clear	None
11:25 AM	0.1	1	1	4.76	6.87	641.6	0.42	0	26.07	-188	0.32	Clear	None
11:27 AM	0.1	0.2	1.2	4.76	6.87	639.7	0.4	0	26.08	-188.5	0.31	Clear	None
11:29 AM	0.1	0.2	1.4	4.76	6.87	639.7	0.39	0	26.07	-188.6	0.31	Clear	None
11:31 AM	0.1	0.2	1.6	4.76	6.88	640.9	0.37	1.68	26.09	-189.4	0.32	Clear	None

Start Purge:	11/7/2023 11:15:00 AM	End Purge:	11/7/2023 11:31:00 AM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0027-020.0-20231107 Sample Date: 11/7/2023 10:25:00 AM
 Well ID: FSA1-MW0027 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	5.11
Top of Screen (ft-BTOC):	14.50	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	24.50	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
10:08 AM			0	5.11								Clear	None
10:18 AM	0.1	1	1	5.13	7.29	809.7	0.25	2.87	26.57	-289.9	0.4	Clear	None
10:20 AM	0.1	0.2	1.2	5.13	7.3	811	0.24	2.1	26.58	-290.8	0.4	Clear	None
10:22 AM	0.1	0.2	1.4	5.13	7.3	830.6	0.24	0	26.58	-294.9	0.41	Clear	None
10:24 AM	0.1	0.2	1.6	5.13	7.29	845.6	0.21	6.41	26.62	-298.9	0.42	Clear	None

Start Purge:	11/7/2023 10:08:00 AM	End Purge:	11/7/2023 10:24:00 AM	Total Volume (gal):	1.6
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GROUNDWATER SAMPLING LOG



Event: FSA IA LTM Nov 2023
 Site Name: Industrial Area/Fuel Storage Area #1 Underground Storage Tank (SWMU C057)
 Project #: 60610905

Sample ID: FSA1-MW0028-020.0-20231107 Sample Date: 11/7/2023 9:58:00 AM
 Well ID: FSA1-MW0028 Sampler: Greg Kusel
 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.88
Top of Screen (ft-BTOC):	15.00	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	25.00	Purge/Sample Method:	PP
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Select VOCs

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	COND (US/CM)	DO (MG/L)	Turb (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
9:41 AM			0	4.88								Clear	None
9:51 AM	0.1	1	1	4.9	7.43	2403.9	0.26	0	26.05	-313.2	1.25	Clear	None
9:53 AM	0.1	0.2	1.2	4.9	7.43	2395.3	0.24	0	26.03	-314.4	1.25	Clear	None
9:55 AM	0.1	0.2	1.4	4.9	7.42	2470.3	0.24	0	26.01	-316.9	1.29	Clear	None
9:57 AM	0.1	0.2	1.6	4.9	7.42	2515.2	0.21	0.49	26.09	-322.9	1.31	Clear	None

Start Purge:	11/7/2023 9:41:00 AM	End Purge:	11/7/2023 9:57:00 AM	Total Volume (gal):	1.6
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APPENDIX D

RIS COMPLETION TICKETS

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Data Checker

Completion Ticket

On 2/29/2024 at 10:24 AM the following files were submitted to Tetra Tech

COMPLETION_AECOM_IA_LTM_20240229.txt

LITHOLOGY_AECOM_IA_LTM_20240229.txt

LOCATION_AECOM_IA_LTM_20240229.txt

PROJECT_AECOM_IA_LTM_20240229.txt

RESULT_AECOM_IA_LTM_20240229.txt

SAMPLE_AECOM_IA_LTM_20240229.txt

WATER_AECOM_IA_LTM_20240229.txt

The following comment was provided with this submission:

AECOM Industrial Area LTM (FSA1, GSSP, KP1 and LETF) May/November 2023

If you need to identify this session at a later date you may use the Ticket Key:

TetraTechExternalClientsProtectedDataRepository2024229_3901579137_kedd_AECOM

You may print this page by clicking on the "Print This Page" button

Thank you for using the Data Checker, to upload more files click the "Data Checker" link in the menu.

[Print this Page](#)

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APPENDIX E

LABORATORY ANALYTICAL DATA

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Environment Testing

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Signature

10.14.2022

Date

Eurofins Environment Testing Southeast, LLC
Alex Montoya
President
5102 LaRoche Avenue
Savannah, GA 31404

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ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 5/31/2023 4:52:31 PM

JOB DESCRIPTION

NASA KSC IA - KARS Park 1 LOC #9

JOB NUMBER

670-20411-1

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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5/31/2023 4:52:31 PM

Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984

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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Qualifiers

Metals

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Job ID: 670-20411-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative
670-20411-1

Receipt

The sample was received on 5/26/2023 3:46 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.2°C

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Client Sample ID: KP1-MW0022-007.0-20230526

Lab Sample ID: 670-20411-1

No Detections.

- 1
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This Detection Summary does not include radiochemical test results.

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Client Sample ID: KP1-MW0022-007.0-20230526

Lab Sample ID: 670-20411-1

Date Collected: 05/26/23 10:27

Matrix: Water

Date Received: 05/26/23 15:46

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	1.1	U	2.2	1.1	ug/L		05/30/23 10:46	05/31/23 00:21	1

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QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 670-36897/3-A
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 36897

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	1.0	U	2.0	1.0	ug/L		05/30/23 10:46	05/31/23 00:01	1

Lab Sample ID: LCS 670-36897/1-A
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 36897

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	100	110		ug/L		110	80 - 120

Lab Sample ID: LCSD 670-36897/2-A
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 36897

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	100	108		ug/L		108	80 - 120	2	20

Lab Sample ID: 670-20425-A-9-A MS
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 36897

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	1.1	U	111	113		ug/L		102	75 - 125

Lab Sample ID: 670-20425-A-9-B MSD
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 36897

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	1.1	U	111	117		ug/L		105	75 - 125	3	20

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Metals

Prep Batch: 36897

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20411-1	KP1-MW0022-007.0-20230526	Total Recoverable	Water	3005A	
MB 670-36897/3-A	Method Blank	Total Recoverable	Water	3005A	
LCS 670-36897/1-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 670-36897/2-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
670-20425-A-9-A MS	Matrix Spike	Total Recoverable	Water	3005A	
670-20425-A-9-B MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 37119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20411-1	KP1-MW0022-007.0-20230526	Total Recoverable	Water	6020B	36897
MB 670-36897/3-A	Method Blank	Total Recoverable	Water	6020B	36897
LCS 670-36897/1-A	Lab Control Sample	Total Recoverable	Water	6020B	36897
LCSD 670-36897/2-A	Lab Control Sample Dup	Total Recoverable	Water	6020B	36897
670-20425-A-9-A MS	Matrix Spike	Total Recoverable	Water	6020B	36897
670-20425-A-9-B MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	36897

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Client Sample ID: KP1-MW0022-007.0-20230526

Lab Sample ID: 670-20411-1

Date Collected: 05/26/23 10:27

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			36897	JR	EET ORL	05/30/23 10:46
Total Recoverable	Analysis	6020B		1	37119	JA	EET ORL	05/31/23 00:21

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

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Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET ORL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET ORL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984



Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - KARS Park 1 LOC #9

Job ID: 670-20411-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-20411-1	KP1-MW0022-007.0-20230526	Water	05/26/23 10:27	05/26/23 15:46

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- 2
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Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-20411-1

Login Number: 20411

List Number: 1

Creator: Clerisier, Meline

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



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ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 6/8/2023 9:55:56 AM

JOB DESCRIPTION

NASA KSC Industrial Area - LETF

JOB NUMBER

670-20420-1

Eurofins Orlando

Job Notes

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Authorization



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6/8/2023 9:55:56 AM

Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984



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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Job ID: 670-20420-1

Laboratory: Eurofins Orlando

Narrative

**Job Narrative
670-20420-1**

Receipt

The samples were received on 5/26/2023 3:46 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.6°C

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Client Sample ID: LETF-MW0001-025.0-20230526

Lab Sample ID: 670-20420-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	7.6		1.0	0.71	ug/L	1		8260D	Total/NA

Client Sample ID: LETF-PSB-MW0001I-024.5-20230526

Lab Sample ID: 670-20420-2

No Detections.

Client Sample ID: LETF-TB-20230526-01

Lab Sample ID: 670-20420-3

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Orlando



Client Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Client Sample ID: LETF-MW0001-025.0-20230526

Lab Sample ID: 670-20420-1

Date Collected: 05/26/23 11:57

Matrix: Water

Date Received: 05/26/23 15:46

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	7.6		1.0	0.71	ug/L			06/05/23 18:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		40 - 146					06/05/23 18:09	1
Dibromofluoromethane (Surr)	105		53 - 146					06/05/23 18:09	1
4-Bromofluorobenzene (Surr)	102		41 - 142					06/05/23 18:09	1

Client Sample ID: LETF-PSB-MW0001I-024.5-20230526

Lab Sample ID: 670-20420-2

Date Collected: 05/26/23 12:44

Matrix: Water

Date Received: 05/26/23 15:46

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			06/05/23 18:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		40 - 146					06/05/23 18:27	1
Dibromofluoromethane (Surr)	104		53 - 146					06/05/23 18:27	1
4-Bromofluorobenzene (Surr)	100		41 - 142					06/05/23 18:27	1

Client Sample ID: LETF-TB-20230526-01

Lab Sample ID: 670-20420-3

Date Collected: 05/26/23 07:00

Matrix: Water

Date Received: 05/26/23 15:46

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			06/05/23 15:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		40 - 146					06/05/23 15:27	1
Dibromofluoromethane (Surr)	102		53 - 146					06/05/23 15:27	1
4-Bromofluorobenzene (Surr)	107		41 - 142					06/05/23 15:27	1

Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		TOL (40-146)	DBFM (53-146)	BFB (41-142)
670-20397-A-15 DU	Duplicate	102	102	102
670-20397-C-18 MS	Matrix Spike	102	101	104
670-20420-1	LETF-MW0001-025.0-2023052 6	101	105	102
670-20420-2	LETF-PSB-MW00011-024.5-202 30526	102	104	100
670-20420-3	LETF-TB-20230526-01	101	102	107
LCS 670-37724/4	Lab Control Sample	104	101	101
MB 670-37724/10	Method Blank	100	101	103

Surrogate Legend

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 670-37724/10
Matrix: Water
Analysis Batch: 37724

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			06/05/23 11:33	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		40 - 146					06/05/23 11:33	1
Dibromofluoromethane (Surr)	101		53 - 146					06/05/23 11:33	1
4-Bromofluorobenzene (Surr)	103		41 - 142					06/05/23 11:33	1

Lab Sample ID: LCS 670-37724/4
Matrix: Water
Analysis Batch: 37724

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	20.0	15.6		ug/L		78	20 - 167
Surrogate	%Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	104		40 - 146				
Dibromofluoromethane (Surr)	101		53 - 146				
4-Bromofluorobenzene (Surr)	101		41 - 142				

Lab Sample ID: 670-20397-C-18 MS
Matrix: Water
Analysis Batch: 37724

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	89		200	301		ug/L		106	20 - 167
Surrogate	%Recovery	MS Qualifier	Limits						
Toluene-d8 (Surr)	102		40 - 146						
Dibromofluoromethane (Surr)	101		53 - 146						
4-Bromofluorobenzene (Surr)	104		41 - 142						

Lab Sample ID: 670-20397-A-15 DU
Matrix: Water
Analysis Batch: 37724

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Vinyl chloride	37		40.0		ug/L		8	30
Surrogate	%Recovery	DU Qualifier	Limits					
Toluene-d8 (Surr)	102		40 - 146					
Dibromofluoromethane (Surr)	102		53 - 146					
4-Bromofluorobenzene (Surr)	102		41 - 142					

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

GC/MS VOA

Analysis Batch: 37724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20420-1	LETF-MW0001-025.0-20230526	Total/NA	Water	8260D	
670-20420-2	LETF-PSB-MW00011-024.5-20230526	Total/NA	Water	8260D	
670-20420-3	LETF-TB-20230526-01	Total/NA	Water	8260D	
MB 670-37724/10	Method Blank	Total/NA	Water	8260D	
LCS 670-37724/4	Lab Control Sample	Total/NA	Water	8260D	
670-20397-C-18 MS	Matrix Spike	Total/NA	Water	8260D	
670-20397-A-15 DU	Duplicate	Total/NA	Water	8260D	

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Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Client Sample ID: LETF-MW0001-025.0-20230526

Lab Sample ID: 670-20420-1

Date Collected: 05/26/23 11:57

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	37724	JFL	EET ORL	06/05/23 18:09

Client Sample ID: LETF-PSB-MW0001I-024.5-20230526

Lab Sample ID: 670-20420-2

Date Collected: 05/26/23 12:44

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	37724	JFL	EET ORL	06/05/23 18:27

Client Sample ID: LETF-TB-20230526-01

Lab Sample ID: 670-20420-3

Date Collected: 05/26/23 07:00

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	37724	JFL	EET ORL	06/05/23 15:27

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET ORL
5030C	Purge and Trap	SW846	EET ORL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984



Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - LETF

Job ID: 670-20420-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-20420-1	LETF-MW0001-025.0-20230526	Water	05/26/23 11:57	05/26/23 15:46
670-20420-2	LETF-PSB-MW0001I-024.5-20230526	Water	05/26/23 12:44	05/26/23 15:46
670-20420-3	LETF-TB-20230526-01	Water	05/26/23 07:00	05/26/23 15:46

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CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Project Name: NASA KSC - Industrial Area
 Site Location: LETF
 TO No.: 80KSC019F0071
 AECOM Project Manager: Chris Marshall cc: Greg Kusel
 Greg Kusel / (772) 631-7426
 Dustin Slater / (407) 766-0747
 Eurofins

COC No. _____ Page: 1 of 1
 Project No. 60610905.Subs 2021-23-Subs 2021-23 Phase:
 Send Invoice To: Instructions in MSA # 195-24548-GV03 EDD to: Jennifer Chastain Cc: Teresa Amendt Jennings
 Deliver Sample Kits To: AECOM Depot, 523 18th Street, Orlando Report to: Jennifer Chastain Cc: Teresa Amendt Jennings
 Deliver Samples To: Eurofins Orlando Site-Specific WS# 15 from QAPP: 15-11

Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (YYYYMMDD)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Standard 14 day G=Grab C=Comp	HCl	Total No. of Containers	Comments
	LETF-MW0001-025.0-202305-26	LETF-MW0001	202305-26	1157	WG	N	G		3	Vinyl chloride by SW82608
	LETF-PSB-MW00011-024.5-202305-26	LETF-PSB-MW00011	202305-26	1244	WG	N	G		3	
	LETF-TB-202305-26-01	LETF-TB-01	202305-26	0700	WQ	TB	G		2	



Field Comments: Report only per QAPP WS # 15-11

Lab Comments: SO 8263

Relinquished by (signature) _____ Date _____

1. _____ Date 5/26/23 Time 1546

2. _____ Date 5/26 Time 1546

3. _____ Date _____ Time _____

Number of coolers in shipment: _____
 Samples Iced?(check) Yes _____ No _____
 Shipping Company: _____
 Tracking No: _____
 Date Shipped: _____

Sample Shipment and Delivery Details

Sample Analysis Requested (Enter number of containers for each test)

Sample Type: AB=Ambient Bk, EB=Equipment Bk, FB=Field Bk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Bk

(3) Preservative added: 4 DEG C=Cool to 4 degrees, Dark=Store in Darkness, store cool at 4 degrees C H2SO4=Hydrogen sulfate, H2SO4 <2=Adjust to pH < 2 with sulfuric acid, H3PO4 <2=Adjust to pH < 2 with phosphoric acid, HCl <2=Adjust to pH < 2 with hydrochloric acid, HNaO4S=Sodium bisulfate preservative, HNO3 <2=Adjust to pH < 2 with nitric acid, MeOH=Methanol preservative, Na2O3S2 3/gal=Add 3 mL 10% sodium thiosulfate per gal, Na2O3S2 4/4oz=4 drops of 10% sodium thiosulfate to 4 oz. NaHSO4 <2=Adjust to pH < 2 with sodium hydrogen sulfate, NaOH >12=Adjust to pH > 12 with sodium hydroxide, NaOH >9=Adjust to pH > 9 with sodium hydroxide, VRC 0.6/500=0.6 g of ascorbic acid to 500mLs, ZnAct 2/500=Add 2 mL of zinc acetate to 500mLs, ZnAct+NaOH >9=Zinc acetate and NaOH to pH>9, store cool at 4C. If NO preservative added leave blank

Rev 8/19

5-1 / 4-6



Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-20420-1

Login Number: 20420

List Number: 1

Creator: Clerisier, Meline

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 6/8/2023 2:47:28 PM

JOB DESCRIPTION

NASA KSC Industrial Area - IDW

JOB NUMBER

670-20417-1

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



Generated
6/8/2023 2:47:28 PM

Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984



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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Job ID: 670-20417-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-20417-1

Receipt

The samples were received on 5/26/2023 3:46 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.6°C

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.



Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.93	I	1.0	0.71	ug/L	1		8260D	Total/NA
Total Phosphorus as P	680		100	40	ug/L	1		365.4	Total/NA

Client Sample ID: IA-TB-20230526 -02

Lab Sample ID: 670-20417-2

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Orlando



Client Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Date Collected: 05/26/23 13:10

Matrix: Water

Date Received: 05/26/23 15:46

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.93	I	1.0	0.71	ug/L			06/06/23 14:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		40 - 146					06/06/23 14:45	1
Dibromofluoromethane (Surr)	110		53 - 146					06/06/23 14:45	1
4-Bromofluorobenzene (Surr)	100		41 - 142					06/06/23 14:45	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	1.1	U	2.2	1.1	ug/L		05/30/23 09:49	05/30/23 20:50	1

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 353.2)	20	U	40	20	ug/L			05/31/23 15:23	1
Total Phosphorus as P (EPA 365.4)	680		100	40	ug/L		05/30/23 09:28	06/05/23 17:48	1

Client Sample ID: IA-TB-20230526 -02

Lab Sample ID: 670-20417-2

Date Collected: 05/26/23 07:00

Matrix: Water

Date Received: 05/26/23 15:46

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			06/06/23 15:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		40 - 146					06/06/23 15:04	1
Dibromofluoromethane (Surr)	112		53 - 146					06/06/23 15:04	1
4-Bromofluorobenzene (Surr)	102		41 - 142					06/06/23 15:04	1

Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TOL	DBFM	BFB
		(40-146)	(53-146)	(41-142)
660-129570-C-1 DU	Duplicate	110	111	103
660-129570-C-2 MS	Matrix Spike	106	110	91
670-20417-1	IA-IDW01-20230526	106	110	100
670-20417-2	IA-TB-20230526 -02	106	112	102
LCS 670-37901/5	Lab Control Sample	109	110	99
MB 670-37901/9	Method Blank	108	114	98

Surrogate Legend

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene (Surr)

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 670-37901/9
Matrix: Water
Analysis Batch: 37901

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			06/06/23 11:43	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	108		40 - 146					06/06/23 11:43	1
Dibromofluoromethane (Surr)	114		53 - 146					06/06/23 11:43	1
4-Bromofluorobenzene (Surr)	98		41 - 142					06/06/23 11:43	1

Lab Sample ID: LCS 670-37901/5
Matrix: Water
Analysis Batch: 37901

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	20.0	18.8		ug/L		94	20 - 167
Surrogate	%Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	109		40 - 146				
Dibromofluoromethane (Surr)	110		53 - 146				
4-Bromofluorobenzene (Surr)	99		41 - 142				

Lab Sample ID: 660-129570-C-2 MS
Matrix: Water
Analysis Batch: 37901

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	0.71	U	20.0	21.1		ug/L		105	20 - 167
Surrogate	%Recovery	MS Qualifier	Limits						
Toluene-d8 (Surr)	106		40 - 146						
Dibromofluoromethane (Surr)	110		53 - 146						
4-Bromofluorobenzene (Surr)	91		41 - 142						

Lab Sample ID: 660-129570-C-1 DU
Matrix: Water
Analysis Batch: 37901

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Vinyl chloride	0.71	U	0.71	U	ug/L		NC	30
Surrogate	%Recovery	DU Qualifier	Limits					
Toluene-d8 (Surr)	110		40 - 146					
Dibromofluoromethane (Surr)	111		53 - 146					
4-Bromofluorobenzene (Surr)	103		41 - 142					

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 670-36875/3-A
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 36875

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	1.0	U	2.0	1.0	ug/L		05/30/23 09:49	05/30/23 20:30	1

Lab Sample ID: LCS 670-36875/1-A
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 36875

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	100	110		ug/L		110	80 - 120

Lab Sample ID: 660-129453-L-1-A MS
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 36875

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lead	1.1	U	111	122		ug/L		109	75 - 125

Lab Sample ID: 660-129453-L-1-B MSD
Matrix: Water
Analysis Batch: 37119

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 36875

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lead	1.1	U	111	119		ug/L		107	75 - 125	2	20

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 670-36864/12-A
Matrix: Water
Analysis Batch: 37850

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 36864

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Phosphorus as P	40	U	100	40	ug/L		05/30/23 09:28	06/05/23 17:20	1

Lab Sample ID: LCS 670-36864/11-A
Matrix: Water
Analysis Batch: 37850

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 36864

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Phosphorus as P	1500	1490		ug/L		99	90 - 110

Lab Sample ID: 670-20455-B-1-A MS
Matrix: Water
Analysis Batch: 37850

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 36864

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Phosphorus as P	2700		1500	4180		ug/L		101	85 - 115

QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Method: 365.4 - Phosphorus, Total (Continued)

Lab Sample ID: 670-20455-B-1-B MSD
 Matrix: Water
 Analysis Batch: 37850

Client Sample ID: Matrix Spike Duplicate
 Prep Type: Total/NA
 Prep Batch: 36864

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Phosphorus as P	2700		1500	4210		ug/L		103	85 - 115	1	20

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QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

GC/MS VOA

Analysis Batch: 37901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total/NA	Water	8260D	
670-20417-2	IA-TB-20230526 -02	Total/NA	Water	8260D	
MB 670-37901/9	Method Blank	Total/NA	Water	8260D	
LCS 670-37901/5	Lab Control Sample	Total/NA	Water	8260D	
660-129570-C-2 MS	Matrix Spike	Total/NA	Water	8260D	
660-129570-C-1 DU	Duplicate	Total/NA	Water	8260D	

Metals

Prep Batch: 36875

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total Recoverable	Water	3005A	
MB 670-36875/3-A	Method Blank	Total Recoverable	Water	3005A	
LCS 670-36875/1-A	Lab Control Sample	Total Recoverable	Water	3005A	
660-129453-L-1-A MS	Matrix Spike	Total Recoverable	Water	3005A	
660-129453-L-1-B MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 37119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total Recoverable	Water	6020B	36875
MB 670-36875/3-A	Method Blank	Total Recoverable	Water	6020B	36875
LCS 670-36875/1-A	Lab Control Sample	Total Recoverable	Water	6020B	36875
660-129453-L-1-A MS	Matrix Spike	Total Recoverable	Water	6020B	36875
660-129453-L-1-B MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	36875

General Chemistry

Prep Batch: 36864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total/NA	Water	365.2/365.3/365	
MB 670-36864/12-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 670-36864/11-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
670-20455-B-1-A MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
670-20455-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 37215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total/NA	Water	353.2	

Analysis Batch: 37850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total/NA	Water	365.4	36864
MB 670-36864/12-A	Method Blank	Total/NA	Water	365.4	36864
LCS 670-36864/11-A	Lab Control Sample	Total/NA	Water	365.4	36864
670-20455-B-1-A MS	Matrix Spike	Total/NA	Water	365.4	36864
670-20455-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	36864

Lab Chronicle

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Date Collected: 05/26/23 13:10

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	37901	T1Y	EET ORL	06/06/23 14:45
Total Recoverable	Prep	3005A			36875	JR	EET ORL	05/30/23 09:49
Total Recoverable	Analysis	6020B		1	37119	JA	EET ORL	05/30/23 20:50
Total/NA	Analysis	353.2		1	37215	CHL	EET ORL	05/31/23 15:23
Total/NA	Prep	365.2/365.3/365			36864	JA	EET ORL	05/30/23 09:28
Total/NA	Analysis	365.4		1	37850	AT	EET ORL	06/05/23 17:48

Client Sample ID: IA-TB-20230526 -02

Lab Sample ID: 670-20417-2

Date Collected: 05/26/23 07:00

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	37901	T1Y	EET ORL	06/06/23 15:04

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984



Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET ORL
6020B	Metals (ICP/MS)	SW846	EET ORL
353.2	Nitrate	EPA	EET ORL
365.4	Phosphorus, Total	EPA	EET ORL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET ORL
365.2/365.3/365	Phosphorus, Total	EPA	EET ORL
5030C	Purge and Trap	SW846	EET ORL

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW

Job ID: 670-20417-1

<u>Lab Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Collected</u>	<u>Received</u>
670-20417-1	IA-IDW01-20230526	Water	05/26/23 13:10	05/26/23 15:46
670-20417-2	IA-TB-20230526 -02	Water	05/26/23 07:00	05/26/23 15:46

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euoifins

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Project Name: NASA KSC - Industrial Area
 Site Location: Industrial Area IDW
 TO No.: 80XSC019F0071
 Greg Kusel / (772) 631-7426

COC No.
 PO No. 148674
 Send Invoice To: Instructions in MSA # 195-24548-GV03
 Deliver Sample Kits To: AECOM Depot, 523 18th Street, Orlando
 Deliver Samples To: Eurofins Orlando

Page: 1 of 1
 Project No. 60610905, Subs 2021-23-Subs 2021-23 | Phase:
 EDD to: Jennifer Chastain Cc: Teresa Arment Jennings
 Report to: Jennifer Chastain Cc: Teresa Arment Jennings
 Site-Specific WS#15 from QAPP: 15-39 & 15-2

Chris Marshall cc: Greg Kusel
 Dustin Slater / (407) 766-0747

Lab Name: Eurofins

Turnaround Time(specify): Standard 14 day

Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (YYYYMMDD)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	G=Grab C=Comp	(3) Total No. of Containers	HCL	HNO3 <2	4 DEG	H2SO4 <2	4 DEG C	Comments
	IA-IDW01-202305 26	IA-IDW01	202305 26	1310	IDW	IDW	G	10	Vinyl chloride by SW8268	Lead by SW610	4 DEG	365.4	4 DEG C	Select PFAS by 537
	IA-TB-202305 26-02	IA-TB 02	202305 26	0700	WQ	TB	G	2						



Field Comments:

Report only per QAPP WS #15-39 & 15-2

Relinquished by (signature) *[Signature]* Date 5/26/23

Received by (signature) *[Signature]* Date 5/26/23

Rate 5/26

Time 1546

Number of coolers in shipment: _____

Samples Iced?(check) Yes _____ No _____

Shipping Company: _____

Tracking No.: _____

Date Shipped: _____

Lab Comments:

670-20417 Chain of Custody

(1) AA=Ambient air, AQ=Air quality control, ASB=Asbestos, CK=Caulk, DS=Storm drain sediment, GS=Soil gas, IC=IDW Concrete, IDD=IDW Solid, IDS=IDW soil, IDW=IDW Water, LF=Free Product, MA=Mastic, PC=Paint Chips, SC=Cement/Concrete, SE=Sediment, SL=Sludge, SO=Soil, SQ=Soil/Solid quality control, SSD=Subsurface sediment, SU=Surface soil (<6 in), SW=Swab or wipe, TA=Animal tissue, TP=Plant tissue, TQ=Tissue quality control, WG=Ground water, WL=Leachate, WO=Ocean water, WP=Drinking water, WQ=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Waste water

(2) Sample Type: AB=Ambient Bk, EB=Equipment Bk, FB=Field Bk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Bk

(3) Preservative added: 4 DEG C= Cool to 4 degrees, Dark=Store in Darkness, store cool at 4 degrees C, H2SO4=Hydrogen sulfate, H2SO4 <2=Adjust to pH < 2 with sulfuric acid, H3PO4 <2=Adjust to pH < 2 with phosphoric acid, HCl <2=Adjust to pH < 2 with hydrochloric acid, HNaO4S= Sodium bisulfate preservation, HNO3 <2=Adjust to pH < 2 with nitric acid, MeOH=Methanol preservation, Na2O3S2 3/gal=Add 3 mL 10% sodium thiosulfate per 1-gal, Na2O3S2 4/4oz=4 drops of 10% sodium thiosulfate to 4 oz, NaHSO4 <2=Adjust to pH < 2 with sodium hydrogen sulfate, NaOH >12=Adjust to pH > 12 with sodium hydroxide, NaOH >9=Adjust to pH > 9 with sodium hydroxide, VitC 0.6/500=0.6 g of ascorbic acid to 500mLs, ZnAct 2/500=Add 2 mL of zinc acetate to 500mLs, ZnAct+NaOH >9=Zinc acetate and NaOH to pH>9, store cool at 4C if NO preservative added leave blank

Rev 8/19

5.1 / 4.6

596



Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-20417-1

Login Number: 20417

List Number: 1

Creator: Clerisier, Meline

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 7/24/2023 11:51:32 AM

JOB DESCRIPTION

NASA KSC Industrial Area - IDW PFAs

JOB NUMBER

670-20417-2

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



Generated
7/24/2023 11:51:32 AM

Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984



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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Qualifiers

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J	Estimated value; value may not be accurate.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Job ID: 670-20417-2

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-20417-2

Receipt

The samples were received on 5/26/2023 3:46 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.6°C

PFAS

Method PFC_IDA: The recovery for the labeled isotope(s) d3-NMePFOSA in the following sample: <AffectedAnalytes> is outside the QC acceptance limits. The following action was taken: This sample was re-extracted outside of the required holding time and the recovery for labeled isotope(s) was again outside of the QC acceptance limits.

Method PFC_IDA: The recovery for the labeled isotope(s) d5-NEtFOSAA in the following sample: IA-IDW01-20230526 (670-20417-1) is outside the QC acceptance limits. The following action was taken: This sample was re-extracted outside of the required holding time and the recovery for labeled isotope(s) was within QC acceptance limits.

Method PFC_IDA: Reporting limits were raised for the following sample: IA-IDW01-20230526 (670-20417-1) due to limited sample volume. Sediment was present in sample: IA-IDW01-20230526 (670-20417-1). at the time of preparation; therefore, the sample was centrifuged and decanted.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.



Detection Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
6:2 Fluorotelomer sulfonic acid	0.0022		0.0021	0.00051	ug/L	1		537 IDA	Total/NA
Perfluorobutanesulfonic acid	0.0026		0.0021	0.00031	ug/L	1		537 IDA	Total/NA
Perfluorobutanoic acid	0.0074		0.0021	0.0010	ug/L	1		537 IDA	Total/NA
Perfluorodecanesulfonic acid	0.00035	I	0.0021	0.00031	ug/L	1		537 IDA	Total/NA
Perfluoroheptanesulfonic acid	0.00031	I	0.0021	0.00031	ug/L	1		537 IDA	Total/NA
Perfluoroheptanoic acid	0.0051		0.0021	0.00031	ug/L	1		537 IDA	Total/NA
Perfluorohexanesulfonic acid	0.0083		0.0021	0.00021	ug/L	1		537 IDA	Total/NA
Perfluorohexanoic acid	0.0046		0.0021	0.00021	ug/L	1		537 IDA	Total/NA
Perfluorononanoic acid	0.00036	I	0.0021	0.00021	ug/L	1		537 IDA	Total/NA
Perfluorooctanesulfonic acid	0.0081	J	0.0021	0.00051	ug/L	1		537 IDA	Total/NA
Perfluorooctanoic acid	0.029		0.0021	0.00031	ug/L	1		537 IDA	Total/NA
Perfluoropentanesulfonic acid	0.0013	I	0.0021	0.00031	ug/L	1		537 IDA	Total/NA
Perfluoropentanoic acid	0.0058		0.0021	0.00031	ug/L	1		537 IDA	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Orlando



Client Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Date Collected: 05/26/23 13:10

Matrix: Water

Date Received: 05/26/23 15:46

Method: EPA 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11CI-PF3OUdS	0.00051	U	0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
4:2 Fluorotelomer sulfonic acid	0.00051	U	0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
6:2 Fluorotelomer sulfonic acid	0.0022		0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
8:2 Fluorotelomer sulfonic acid	0.00062	U	0.0021	0.00062	ug/L		06/14/23 07:27	06/21/23 02:49	1
9CI-PF3ONS	0.00051	U	0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
DONA	0.00051	U	0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
HFPODA	0.00041	U	0.0021	0.00041	ug/L		06/14/23 07:27	06/21/23 02:49	1
NEtFOSAA	0.00051	U	0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
NMeFOSAA	0.00041	U	0.0021	0.00041	ug/L		06/14/23 07:27	06/21/23 02:49	1
NMeFOSA	0.00072	U	0.0021	0.00072	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorobutanesulfonic acid	0.0026		0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorobutanoic acid	0.0074		0.0021	0.0010	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorodecanesulfonic acid	0.00035	I	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorodecanoic acid	0.00031	U	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorododecanoic acid	0.00041	U	0.0021	0.00041	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluoroheptanesulfonic acid	0.00031	I	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluoroheptanoic acid	0.0051		0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorohexanesulfonic acid	0.0083		0.0021	0.00021	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorohexanoic acid	0.0046		0.0021	0.00021	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorononanesulfonic acid	0.00031	U	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorononanoic acid	0.00036	I	0.0021	0.00021	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorooctanesulfonamide	0.00031	U	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorooctanesulfonic acid	0.0081	J	0.0021	0.00051	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorooctanoic acid	0.029		0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluoropentanesulfonic acid	0.0013	I	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluoropentanoic acid	0.0058		0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorotetradecanoic acid	0.00041	U	0.0021	0.00041	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluorotridecanoic acid	0.00041	U	0.0021	0.00041	ug/L		06/14/23 07:27	06/21/23 02:49	1
Perfluoroundecanoic acid	0.00031	U	0.0021	0.00031	ug/L		06/14/23 07:27	06/21/23 02:49	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-4:2 FTS	177		10 - 200	06/14/23 07:27	06/21/23 02:49	1
M2-6:2 FTS	119		17 - 200	06/14/23 07:27	06/21/23 02:49	1
M2-8:2 FTS	88		33 - 200	06/14/23 07:27	06/21/23 02:49	1
13C2 PFTeDA	26		10 - 179	06/14/23 07:27	06/21/23 02:49	1
13C3 HFPO-DA	116		17 - 185	06/14/23 07:27	06/21/23 02:49	1
13C3 PFBS	117		16 - 200	06/14/23 07:27	06/21/23 02:49	1
13C4 PFBA	102		42 - 165	06/14/23 07:27	06/21/23 02:49	1
13C4 PFHpA	89		31 - 182	06/14/23 07:27	06/21/23 02:49	1
13C5 PFPeA	104		38 - 187	06/14/23 07:27	06/21/23 02:49	1
13C8 PFOA	83		48 - 162	06/14/23 07:27	06/21/23 02:49	1
13C8 PFOS	60		51 - 159	06/14/23 07:27	06/21/23 02:49	1
d3-NMeFOSAA	38		31 - 174	06/14/23 07:27	06/21/23 02:49	1
d5-NEtFOSAA	28	*	29 - 195	06/14/23 07:27	06/21/23 02:49	1
13C3 PFHxS	83		28 - 188	06/14/23 07:27	06/21/23 02:49	1
13C5 PFHxA	105		24 - 179	06/14/23 07:27	06/21/23 02:49	1
13C6 PFDA	63		49 - 163	06/14/23 07:27	06/21/23 02:49	1
13C7 PFUnA	57		34 - 174	06/14/23 07:27	06/21/23 02:49	1
d3-NMePFOSA	0.09	*	10 - 155	06/14/23 07:27	06/21/23 02:49	1
13C8 FOSA	44		10 - 168	06/14/23 07:27	06/21/23 02:49	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Date Collected: 05/26/23 13:10

Matrix: Water

Date Received: 05/26/23 15:46

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C2-PFDoDA	40		17 - 176	06/14/23 07:27	06/21/23 02:49	1
13C9 PFNA	69		51 - 167	06/14/23 07:27	06/21/23 02:49	1

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Isotope Dilution Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method: 537 IDA - EPA 537 Isotope Dilution

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	M242FTS (10-200)	M262FTS (17-200)	M282FTS (33-200)	PFTDA (10-179)	HFPODA (17-185)	C3PFBS (16-200)	PFBA (42-165)	C4PFHA (31-182)
410-128158-J-9-C MS	Matrix Spike	150	142	144	92	122	137	118	108
410-128158-J-9-D MSD	Matrix Spike Duplicate	169	127	137	93	137	118	106	110
670-20417-1	IA-IDW01-20230526	177	119	88	26	116	117	102	89
LCS 410-386309/3-A	Lab Control Sample	131	134	123	109	127	109	108	109
MB 410-386309/1-A	Method Blank	132	127	117	100	103	124	113	102

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFPeA (38-187)	C8PFOA (48-162)	C8PFOS (51-159)	d3NMFOS (31-174)	d5NEFOS (29-195)	C3PFHS (28-188)	13C5PHA (24-179)	C6PFDA (49-163)
410-128158-J-9-C MS	Matrix Spike	124	121	107	111	105	115	120	99
410-128158-J-9-D MSD	Matrix Spike Duplicate	112	115	128	120	123	120	127	106
670-20417-1	IA-IDW01-20230526	104	83	60	38	28 *	83	105	63
LCS 410-386309/3-A	Lab Control Sample	104	115	120	103	98	109	105	102
MB 410-386309/1-A	Method Blank	121	107	114	107	113	104	108	98

		Percent Isotope Dilution Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	13C7PUA (34-174)	d3NMFSA (10-155)	PFOSA (10-168)	PFDODA (17-176)	C9PFNA (51-167)
410-128158-J-9-C MS	Matrix Spike	100	3 *	61	88	105
410-128158-J-9-D MSD	Matrix Spike Duplicate	123	51	116	106	131
670-20417-1	IA-IDW01-20230526	57	0.09 *	44	40	69
LCS 410-386309/3-A	Lab Control Sample	102	61	108	112	113
MB 410-386309/1-A	Method Blank	112	67	99	100	120

Surrogate Legend

- M242FTS = M2-4:2 FTS
- M262FTS = M2-6:2 FTS
- M282FTS = M2-8:2 FTS
- PFTDA = 13C2 PFTeDA
- HFPODA = 13C3 HFPO-DA
- C3PFBS = 13C3 PFBS
- PFBA = 13C4 PFBA
- C4PFHA = 13C4 PFHpA
- PFPeA = 13C5 PFPeA
- C8PFOA = 13C8 PFOA
- C8PFOS = 13C8 PFOS
- d3NMFOS = d3-NMeFOSAA
- d5NEFOS = d5-NEtFOSAA
- C3PFHS = 13C3 PFHxS
- 13C5PHA = 13C5 PFHxA
- C6PFDA = 13C6 PFDA
- 13C7PUA = 13C7 PFUnA
- d3NMFSA = d3-NMePFOSA
- PFOSA = 13C8 FOSA
- PFDODA = 13C2-PFDODA
- C9PFNA = 13C9 PFNA

QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method: 537 IDA - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-386309/1-A
Matrix: Water
Analysis Batch: 388768

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386309

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11Cl-PF3OUdS	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
4:2 Fluorotelomer sulfonic acid	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
6:2 Fluorotelomer sulfonic acid	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
8:2 Fluorotelomer sulfonic acid	0.00060	U	0.0020	0.00060	ug/L		06/14/23 07:27	06/20/23 21:24	1
9Cl-PF3ONS	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
DONA	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
HFPODA	0.00040	U	0.0020	0.00040	ug/L		06/14/23 07:27	06/20/23 21:24	1
NEtFOSAA	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
NMeFOSAA	0.00040	U	0.0020	0.00040	ug/L		06/14/23 07:27	06/20/23 21:24	1
NMeFOSA	0.00070	U	0.0020	0.00070	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorobutanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorobutanoic acid	0.0010	U	0.0020	0.0010	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorodecanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorodecanoic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorododecanoic acid	0.00040	U	0.0020	0.00040	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluoroheptanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluoroheptanoic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorohexanesulfonic acid	0.00020	U	0.0020	0.00020	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorohexanoic acid	0.00020	U	0.0020	0.00020	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorononanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorononanoic acid	0.00020	U	0.0020	0.00020	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorooctanesulfonamide	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorooctanesulfonic acid	0.00050	U	0.0020	0.00050	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorooctanoic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluoropentanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluoropentanoic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorotetradecanoic acid	0.00040	U	0.0020	0.00040	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluorotridecanoic acid	0.00040	U	0.0020	0.00040	ug/L		06/14/23 07:27	06/20/23 21:24	1
Perfluoroundecanoic acid	0.00030	U	0.0020	0.00030	ug/L		06/14/23 07:27	06/20/23 21:24	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-4:2 FTS	132		10 - 200	06/14/23 07:27	06/20/23 21:24	1
M2-6:2 FTS	127		17 - 200	06/14/23 07:27	06/20/23 21:24	1
M2-8:2 FTS	117		33 - 200	06/14/23 07:27	06/20/23 21:24	1
13C2 PFTeDA	100		10 - 179	06/14/23 07:27	06/20/23 21:24	1
13C3 HFPO-DA	103		17 - 185	06/14/23 07:27	06/20/23 21:24	1
13C3 PFBS	124		16 - 200	06/14/23 07:27	06/20/23 21:24	1
13C4 PFBA	113		42 - 165	06/14/23 07:27	06/20/23 21:24	1
13C4 PFHpA	102		31 - 182	06/14/23 07:27	06/20/23 21:24	1
13C5 PFPeA	121		38 - 187	06/14/23 07:27	06/20/23 21:24	1
13C8 PFOA	107		48 - 162	06/14/23 07:27	06/20/23 21:24	1
13C8 PFOS	114		51 - 159	06/14/23 07:27	06/20/23 21:24	1
d3-NMeFOSAA	107		31 - 174	06/14/23 07:27	06/20/23 21:24	1
d5-NEtFOSAA	113		29 - 195	06/14/23 07:27	06/20/23 21:24	1
13C3 PFHxS	104		28 - 188	06/14/23 07:27	06/20/23 21:24	1
13C5 PFHxA	108		24 - 179	06/14/23 07:27	06/20/23 21:24	1
13C6 PFDA	98		49 - 163	06/14/23 07:27	06/20/23 21:24	1
13C7 PFUnA	112		34 - 174	06/14/23 07:27	06/20/23 21:24	1

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QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-386309/1-A
Matrix: Water
Analysis Batch: 388768

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386309

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
d3-NMePFOSA	67		10 - 155	06/14/23 07:27	06/20/23 21:24	1
13C8 FOSA	99		10 - 168	06/14/23 07:27	06/20/23 21:24	1
13C2-PFDoDA	100		17 - 176	06/14/23 07:27	06/20/23 21:24	1
13C9 PFNA	120		51 - 167	06/14/23 07:27	06/20/23 21:24	1

Lab Sample ID: LCS 410-386309/3-A
Matrix: Water
Analysis Batch: 388768

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386309

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4:2 Fluorotelomer sulfonic acid	0.0239	0.0227		ug/L		95	55 - 139
6:2 Fluorotelomer sulfonic acid	0.0243	0.0202		ug/L		83	28 - 173
8:2 Fluorotelomer sulfonic acid	0.0245	0.0222		ug/L		91	55 - 138
9Cl-PF3ONS	0.0238	0.0259		ug/L		109	59 - 135
DONA	0.0242	0.0227		ug/L		94	55 - 143
HFPODA	0.0256	0.0206		ug/L		80	50 - 135
NEtFOSAA	0.0256	0.0244		ug/L		95	55 - 134
NMeFOSAA	0.0256	0.0270		ug/L		105	59 - 140
NMeFOSA	0.0256	0.0259		ug/L		101	64 - 143
Perfluorobutanesulfonic acid	0.0227	0.0205		ug/L		90	53 - 138
Perfluorobutanoic acid	0.0256	0.0213		ug/L		83	59 - 136
Perfluorodecanesulfonic acid	0.0247	0.0234		ug/L		95	55 - 137
Perfluorodecanoic acid	0.0256	0.0288		ug/L		112	56 - 138
Perfluorododecanoic acid	0.0256	0.0208		ug/L		81	59 - 143
Perfluoroheptanesulfonic acid	0.0244	0.0246		ug/L		101	56 - 140
Perfluoroheptanoic acid	0.0256	0.0233		ug/L		91	59 - 145
Perfluorohexanesulfonic acid	0.0233	0.0219		ug/L		94	58 - 134
Perfluorohexanoic acid	0.0256	0.0269		ug/L		105	58 - 139
Perfluorononanesulfonic acid	0.0246	0.0240		ug/L		98	59 - 136
Perfluorononanoic acid	0.0256	0.0285		ug/L		111	61 - 139
Perfluorooctanesulfonamide	0.0256	0.0215		ug/L		84	43 - 167
Perfluorooctanesulfonic acid	0.0237	0.0235		ug/L		99	45 - 150
Perfluorooctanoic acid	0.0256	0.0260		ug/L		101	51 - 145
Perfluoropentanesulfonic acid	0.0240	0.0245		ug/L		102	55 - 140
Perfluoropentanoic acid	0.0256	0.0229		ug/L		89	57 - 141
Perfluorotetradecanoic acid	0.0256	0.0261		ug/L		102	62 - 139
Perfluorotridecanoic acid	0.0256	0.0254		ug/L		99	58 - 146
Perfluoroundecanoic acid	0.0256	0.0238		ug/L		93	60 - 141

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	131		10 - 200
M2-6:2 FTS	134		17 - 200
M2-8:2 FTS	123		33 - 200
13C2 PFTeDA	109		10 - 179
13C3 HFPO-DA	127		17 - 185
13C3 PFBS	109		16 - 200
13C4 PFBA	108		42 - 165
13C4 PFHpA	109		31 - 182

QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-386309/3-A
Matrix: Water
Analysis Batch: 388768

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386309

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C5 PFPeA	104		38 - 187
13C8 PFOA	115		48 - 162
13C8 PFOS	120		51 - 159
d3-NMeFOSAA	103		31 - 174
d5-NEtFOSAA	98		29 - 195
13C3 PFHxS	109		28 - 188
13C5 PFHxA	105		24 - 179
13C6 PFDA	102		49 - 163
13C7 PFUnA	102		34 - 174
d3-NMePFOSA	61		10 - 155
13C8 FOSA	108		10 - 168
13C2-PFDoDA	112		17 - 176
13C9 PFNA	113		51 - 167

Lab Sample ID: 410-128158-J-9-C MS
Matrix: Water
Analysis Batch: 388768

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 386309

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec Limits
	Result	Qualifier	Added	Result	Qualifier				
11Cl-PF3OUdS	0.00045	U	0.0202	0.0190		ug/L		94	53 - 139
4:2 Fluorotelomer sulfonic acid	0.00045	U	0.0203	0.0189		ug/L		93	55 - 139
6:2 Fluorotelomer sulfonic acid	0.00045	U	0.0206	0.0173		ug/L		84	28 - 173
8:2 Fluorotelomer sulfonic acid	0.00054	U	0.0208	0.0144		ug/L		69	55 - 138
9Cl-PF3ONS	0.00045	U	0.0202	0.0215		ug/L		106	59 - 135
DONA	0.00045	U	0.0205	0.0212		ug/L		103	55 - 143
HFPODA	0.00036	U	0.0217	0.0200		ug/L		92	50 - 135
NEtFOSAA	0.00045	U	0.0217	0.0224		ug/L		103	55 - 134
NMeFOSAA	0.00036	U	0.0217	0.0217		ug/L		100	59 - 140
NMeFOSA	0.00063	U	0.0217	0.0182		ug/L		84	64 - 143
Perfluorobutanesulfonic acid	0.00032	I	0.0192	0.0192		ug/L		98	53 - 138
Perfluorobutanoic acid	0.00089	U	0.0217	0.0206		ug/L		95	59 - 136
Perfluorodecanesulfonic acid	0.00027	U	0.0209	0.0223		ug/L		107	55 - 137
Perfluorodecanoic acid	0.00030	I	0.0217	0.0214		ug/L		97	56 - 138
Perfluorododecanoic acid	0.00036	U	0.0217	0.0279		ug/L		128	59 - 143
Perfluoroheptanesulfonic acid	0.00027	U	0.0207	0.0202		ug/L		98	56 - 140
Perfluoroheptanoic acid	0.00049	I	0.0217	0.0230		ug/L		103	59 - 145
Perfluorohexanesulfonic acid	0.00032	I	0.0198	0.0210		ug/L		104	58 - 134
Perfluorohexanoic acid	0.00018	U	0.0217	0.0234		ug/L		108	58 - 139
Perfluorononanesulfonic acid	0.00027	U	0.0209	0.0200		ug/L		96	59 - 136
Perfluorononanoic acid	0.00024	I J	0.0217	0.0263		ug/L		120	61 - 139
Perfluorooctanesulfonamide	0.00027	I	0.0217	0.0202		ug/L		92	43 - 167
Perfluorooctanesulfonic acid	0.0018		0.0201	0.0217		ug/L		99	45 - 150
Perfluorooctanoic acid	0.0076		0.0217	0.0265		ug/L		87	51 - 145
Perfluoropentanesulfonic acid	0.00027	U	0.0204	0.0208		ug/L		102	55 - 140
Perfluoropentanoic acid	0.00059	I	0.0217	0.0232		ug/L		104	57 - 141
Perfluorotetradecanoic acid	0.00036	U	0.0217	0.0205		ug/L		95	62 - 139
Perfluorotridecanoic acid	0.00036	U	0.0217	0.0228		ug/L		105	58 - 146
Perfluoroundecanoic acid	0.00027	U	0.0217	0.0225		ug/L		103	60 - 141

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	MS MS		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	150		10 - 200
M2-6:2 FTS	142		17 - 200
M2-8:2 FTS	144		33 - 200
13C2 PFTeDA	92		10 - 179
13C3 HFPO-DA	122		17 - 185
13C3 PFBS	137		16 - 200
13C4 PFBA	118		42 - 165
13C4 PFHpA	108		31 - 182
13C5 PFPeA	124		38 - 187
13C8 PFOA	121		48 - 162
13C8 PFOS	107		51 - 159
d3-NMeFOSAA	111		31 - 174
d5-NEtFOSAA	105		29 - 195
13C3 PFHxS	115		28 - 188
13C5 PFHxA	120		24 - 179
13C6 PFDA	99		49 - 163
13C7 PFUnA	100		34 - 174
d3-NMePFOSA	3 *		10 - 155
13C8 FOSA	61		10 - 168
13C2-PFDoDA	88		17 - 176
13C9 PFNA	105		51 - 167

Lab Sample ID: 410-128158-J-9-D MSD

Matrix: Water

Analysis Batch: 388768

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 386309

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits		Limit
11Cl-PF3OUdS	0.00045	U	0.0207	0.0197		ug/L		95	53 - 139	4	30
4:2 Fluorotelomer sulfonic acid	0.00045	U	0.0208	0.0154		ug/L		74	55 - 139	21	30
6:2 Fluorotelomer sulfonic acid	0.00045	U	0.0211	0.0196		ug/L		93	28 - 173	13	30
8:2 Fluorotelomer sulfonic acid	0.00054	U	0.0213	0.0179		ug/L		84	55 - 138	22	30
9Cl-PF3ONS	0.00045	U	0.0207	0.0190		ug/L		92	59 - 135	12	30
DONA	0.00045	U	0.0210	0.0197		ug/L		94	55 - 143	8	30
HFPODA	0.00036	U	0.0222	0.0158		ug/L		71	50 - 135	23	30
NEtFOSAA	0.00045	U	0.0222	0.0206		ug/L		93	55 - 134	9	30
NMeFOSAA	0.00036	U	0.0222	0.0235		ug/L		106	59 - 140	8	30
NMeFOSA	0.00063	U	0.0222	0.0197		ug/L		88	64 - 143	8	30
Perfluorobutanesulfonic acid	0.00032	I	0.0197	0.0190		ug/L		95	53 - 138	1	30
Perfluorobutanoic acid	0.00089	U	0.0222	0.0203		ug/L		91	59 - 136	2	30
Perfluorodecanesulfonic acid	0.00027	U	0.0214	0.0195		ug/L		91	55 - 137	14	30
Perfluorodecanoic acid	0.00030	I	0.0222	0.0253		ug/L		113	56 - 138	17	30
Perfluorododecanoic acid	0.00036	U	0.0222	0.0225		ug/L		101	59 - 143	22	30
Perfluoroheptanesulfonic acid	0.00027	U	0.0212	0.0187		ug/L		88	56 - 140	8	30
Perfluoroheptanoic acid	0.00049	I	0.0222	0.0239		ug/L		105	59 - 145	4	30
Perfluorohexanesulfonic acid	0.00032	I	0.0203	0.0188		ug/L		91	58 - 134	11	30
Perfluorohexanoic acid	0.00018	U	0.0222	0.0220		ug/L		99	58 - 139	6	30
Perfluorononanesulfonic acid	0.00027	U	0.0213	0.0208		ug/L		97	59 - 136	4	30
Perfluorononanoic acid	0.00024	I J	0.0222	0.0249		ug/L		111	61 - 139	5	30
Perfluorooctanesulfonamide	0.00027	I	0.0222	0.0211		ug/L		94	43 - 167	5	30
Perfluorooctanesulfonic acid	0.0018		0.0206	0.0216		ug/L		96	45 - 150	0	30
Perfluorooctanoic acid	0.0076		0.0222	0.0259		ug/L		82	51 - 145	2	30
Perfluoropentanesulfonic acid	0.00027	U	0.0209	0.0192		ug/L		92	55 - 140	8	30

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QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: 410-128158-J-9-D MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 388768

Prep Batch: 386309

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoropentanoic acid	0.00059	I	0.0222	0.0229		ug/L		100	57 - 141	1	30
Perfluorotetradecanoic acid	0.00036	U	0.0222	0.0249		ug/L		112	62 - 139	19	30
Perfluorotridecanoic acid	0.00036	U	0.0222	0.0246		ug/L		111	58 - 146	8	30
Perfluoroundecanoic acid	0.00027	U	0.0222	0.0217		ug/L		98	60 - 141	4	30

Isotope Dilution	MSD		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	169		10 - 200
M2-6:2 FTS	127		17 - 200
M2-8:2 FTS	137		33 - 200
13C2 PFTeDA	93		10 - 179
13C3 HFPO-DA	137		17 - 185
13C3 PFBS	118		16 - 200
13C4 PFBA	106		42 - 165
13C4 PFHpA	110		31 - 182
13C5 PFPeA	112		38 - 187
13C8 PFOA	115		48 - 162
13C8 PFOS	128		51 - 159
d3-NMeFOSAA	120		31 - 174
d5-NEtFOSAA	123		29 - 195
13C3 PFHxS	120		28 - 188
13C5 PFHxA	127		24 - 179
13C6 PFDA	106		49 - 163
13C7 PFUnA	123		34 - 174
d3-NMePFOSA	51		10 - 155
13C8 FOSA	116		10 - 168
13C2-PFDoDA	106		17 - 176
13C9 PFNA	131		51 - 167

QC Association Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

LCMS

Prep Batch: 386309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total/NA	Water	SPE	
MB 410-386309/1-A	Method Blank	Total/NA	Water	SPE	
LCS 410-386309/3-A	Lab Control Sample	Total/NA	Water	SPE	
410-128158-J-9-C MS	Matrix Spike	Total/NA	Water	SPE	
410-128158-J-9-D MSD	Matrix Spike Duplicate	Total/NA	Water	SPE	

Analysis Batch: 388768

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1	IA-IDW01-20230526	Total/NA	Water	537 IDA	386309
MB 410-386309/1-A	Method Blank	Total/NA	Water	537 IDA	386309
LCS 410-386309/3-A	Lab Control Sample	Total/NA	Water	537 IDA	386309
410-128158-J-9-C MS	Matrix Spike	Total/NA	Water	537 IDA	386309
410-128158-J-9-D MSD	Matrix Spike Duplicate	Total/NA	Water	537 IDA	386309

Prep Batch: 391588

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1 - RE	IA-IDW01-20230526	Total/NA	Water	SPE	
MB 410-391588/1-A	Method Blank	Total/NA	Water	SPE	
LCS 410-391588/2-A	Lab Control Sample	Total/NA	Water	SPE	
LCSD 410-391588/3-A	Lab Control Sample Dup	Total/NA	Water	SPE	

Analysis Batch: 397627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20417-1 - RE	IA-IDW01-20230526	Total/NA	Water	537 IDA	391588
MB 410-391588/1-A	Method Blank	Total/NA	Water	537 IDA	391588
LCS 410-391588/2-A	Lab Control Sample	Total/NA	Water	537 IDA	391588
LCSD 410-391588/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	391588

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Client Sample ID: IA-IDW01-20230526

Lab Sample ID: 670-20417-1

Date Collected: 05/26/23 13:10

Matrix: Water

Date Received: 05/26/23 15:46

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SPE			386309	RC3V	ELLE	06/14/23 07:27
Total/NA	Analysis	537 IDA		1	388768	JVK6	ELLE	06/21/23 02:49
Total/NA	Prep	SPE	RE		391588	M4QQ	ELLE	06/28/23 07:20
Total/NA	Analysis	537 IDA	RE	1	397627	JVK6	ELLE	07/18/23 00:36

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300



Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87997	06-30-24

1

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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Method	Method Description	Protocol	Laboratory
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE
SPE	PFAS by SPE	Lab SOP	ELLE

Protocol References:

- EPA = US Environmental Protection Agency
- Lab SOP = Laboratory Standard Operating Procedure

Laboratory References:

- ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300



Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area - IDW PFAs

Job ID: 670-20417-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-20417-1	IA-IDW01-20230526	Water	05/26/23 13:10	05/26/23 15:46

1

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euoifins

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

Project Name: NASA KSC - Industrial Area
 Site Location: Industrial Area IDW
 TO No.: 80XSC019F0071
 Greg Kusel / (772) 631-7426

COC No. _____
 PO No. 148674
 Send Invoice To: Instructions in MSA # 195-245-48-GV03
 Deliver Sample Kits To: AECOM Depot, 523 18th Street, Orlando
 Deliver Samples To: Eurofins Orlando

Page: 1 of 1
 Project No. 60610905, Subs 2021-23-Subs 2021-23 | Phase:
 EDD to: Jennifer Chastain Cc: Teresa Arment Jennings
 Report to: Jennifer Chastain Cc: Teresa Arment Jennings
 Site-Specific WS#15 from QAPP: 15-39 & 15-2

Turnaround Time(specify): Standard 14 day
 Chris Marshall cc: Greg Kusel
 Dustin Slater / (407) 766-0747

Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (YYYYMMDD)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	G=Grab C=Comp	(3) Total No. of Containers	HCL	HNO3 <2	4 DEG	H2SO4 <2	4 DEG C	Comments
	IA-IDW01-202305 26	IA-IDW01	202305 26	1310	IDW	IDW	G	10	Vinyl chloride by SW8268	Lead by SW610	Nitrate by EPA 300.0	Phosphorous (Total) by EPA 365.4	Select PFAS by 537	
	IA-TB-202305 26-02	IA-TB 02	202305 26	0700	WQ	TB	G	2						



Field Comments:

Report only per QAPP WS #15-39 & 15-2

Relinquished by (signature) _____ Date 5/26/23

Received by (signature) _____ Date 5/26/23

Rate 5/26

Time 1546

Number of coolers in shipment: _____

Samples Iced? (check) Yes _____ No _____

Shipping Company: _____

Tracking No.: _____

Date Shipped: _____

Lab Comments:

670-20417 Chain of Custody

(1) AA=Ambient air, AQ=Air quality control, ASB=Asbestos, CK=Caulk, DS=Storm drain sediment, GS=Soil gas, IC=IDW Concrete, IDD=IDW Solid, IDS=IDW soil, IDW=IDW Water, LF=Free Product, MA=Mastic, PC=Paint Chips, SC=Cement/Concrete, SE=Sediment, SL=Sludge, SO=Soil, SQ=Soil/Solid quality control, SSD=Subsurface sediment, SU=Surface soil (<6 in), SW=Swab or wipe, TA=Animal tissue, TP=Plant tissue, TQ=Tissue quality control, WG=Ground water, WL=Leachate, WO=Ocean water, WP=Drinking water, WQ=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Waste water

(2) Sample Type: AB=Ambient Bk, EB=Equipment Bk, FB=Field Bk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Bk

(3) Preservative added: 4 DEG C=Cool to 4 degrees, Dark=Store in Darkness, store cool at 4 degrees, H2SO4=Hydrogen sulfate, H2SO4 <2=Adjust to pH < 2 with sulfuric acid, H3PO4 <2=Adjust to pH < 2 with phosphoric acid, HCl <2=Adjust to pH < 2 with hydrochloric acid, HNaO4S=Sodium bisulfate preservation, HNO3 <2=Adjust to pH < 2 with nitric acid, MeOH=Methanol preservation, Na2O3S2 3/gal=Add 3 mL 10% sodium thiosulfate per 1-gal, Na2O3S2 4/4oz=4 drops of 10% sodium thiosulfate to 4 oz, NaHSO4 <2=Adjust to pH < 2 with sodium hydrogen sulfate, NaOH >12=Adjust to pH > 12 with sodium hydroxide, NaOH >9=Adjust to pH > 9 with sodium hydroxide, VitC 0.6/500=0.6 g of ascorbic acid to 500mL, ZnAct 2/500=Add 2 mL of zinc acetate to 500mL, ZnAct+NaOH >9=Zinc acetate and NaOH to pH>9, store cool at 4C if NO preservative added leave blank

Rev 8/19

5.1 / 4.6

596



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Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-20417-2

Login Number: 20417

List Number: 1

Creator: Clerisier, Meline

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-20417-2

Login Number: 20417

List Number: 2

Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Creation: 05/31/23 02:25 PM

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	False	Refer to Job Narrative for details.
COC is filled out in ink and legible.	N/A	
COC is filled out with all pertinent information.	N/A	
There are no discrepancies between the containers received and the COC.	N/A	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	N/A	



ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 11/21/2023 1:39:39 PM Revision 1

JOB DESCRIPTION

NASA KSC IA - GSSP

JOB NUMBER

670-29972-1

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984

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Revision 1



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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Job ID: 670-29972-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-29972-1

REVISION

The report being provided is a revision of the original report sent on 11/16/2023. The report (revision 1) is being revised due to update of sample id to match chain of custody.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method. Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 11/7/2023 3:00 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 11.5°C

GC/MS VOA

Method 8260D: The following samples were diluted to bring the concentration of target analytes within the calibration range: GSSP-MW0019-020.0-20231106 (670-29972-2) and GSSP-MW0020-030.0-20231106 (670-29972-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0013-010.0-20231106

Lab Sample ID: 670-29972-1

No Detections.

Client Sample ID: GSSP-MW0019-020.0-20231106

Lab Sample ID: 670-29972-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride - DL	85		10	7.1	ug/L	10		8260D	Total/NA

Client Sample ID: GSSP-MW0020-030.0-20231106

Lab Sample ID: 670-29972-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride - DL	180		25	18	ug/L	25		8260D	Total/NA

Client Sample ID: GSSP-MW0024R-020.0-20231106

Lab Sample ID: 670-29972-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	39		0.18	0.027	ug/L	1		8270E SIM	Total/NA

Client Sample ID: GSSP-MW0034-007.0-20231106

Lab Sample ID: 670-29972-5

No Detections.

Client Sample ID: GSSP-MW0035-020.0-20231106

Lab Sample ID: 670-29972-6

No Detections.

Client Sample ID: GSSP-MW0036-035.0-20231106

Lab Sample ID: 670-29972-7

No Detections.

Client Sample ID: GSSP-MW0044R-030.0-20231106

Lab Sample ID: 670-29972-8

No Detections.

Client Sample ID: GSSP-MW0053-020.0-20231106

Lab Sample ID: 670-29972-9

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	63		5.0	3.6	ug/L	5		8260D	Total/NA

Client Sample ID: GSSP-MW0059-018.5-20231106

Lab Sample ID: 670-29972-10

No Detections.

Client Sample ID: GSSP-MW0060-012.5-20231106

Lab Sample ID: 670-29972-11

No Detections.

Client Sample ID: GSSP-MW0061-018.5-20231106

Lab Sample ID: 670-29972-12

No Detections.

Client Sample ID: GSSP-MW0062-012.5-20231106

Lab Sample ID: 670-29972-13

No Detections.

Client Sample ID: GSSP-MW0063-018.5-20231106

Lab Sample ID: 670-29972-14

No Detections.

Client Sample ID: GSSP-TB-20231106

Lab Sample ID: 670-29972-15

No Detections.

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0013-010.0-20231106

Lab Sample ID: 670-29972-1

Date Collected: 11/06/23 15:24

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 15:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		40 - 146					11/15/23 15:38	1
4-Bromofluorobenzene (Surr)	93		41 - 142					11/15/23 15:38	1
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 15:38	1

Client Sample ID: GSSP-MW0019-020.0-20231106

Lab Sample ID: 670-29972-2

Date Collected: 11/06/23 11:49

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	85		10	7.1	ug/L			11/15/23 18:24	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		40 - 146					11/15/23 18:24	10
4-Bromofluorobenzene (Surr)	92		41 - 142					11/15/23 18:24	10
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 18:24	10

Client Sample ID: GSSP-MW0020-030.0-20231106

Lab Sample ID: 670-29972-3

Date Collected: 11/06/23 12:13

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	180		25	18	ug/L			11/15/23 11:48	25
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		40 - 146					11/15/23 11:48	25
4-Bromofluorobenzene (Surr)	94		41 - 142					11/15/23 11:48	25
Dibromofluoromethane (Surr)	103		53 - 146					11/15/23 11:48	25

Client Sample ID: GSSP-MW0024R-020.0-20231106

Lab Sample ID: 670-29972-4

Date Collected: 11/06/23 13:28

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 15:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		40 - 146					11/15/23 15:03	1
4-Bromofluorobenzene (Surr)	94		41 - 142					11/15/23 15:03	1
Dibromofluoromethane (Surr)	102		53 - 146					11/15/23 15:03	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	39		0.18	0.027	ug/L		11/08/23 15:25	11/09/23 15:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	81		42 - 157				11/08/23 15:25	11/09/23 15:42	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0024R-020.0-20231106

Lab Sample ID: 670-29972-4

Date Collected: 11/06/23 13:28

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Fluoranthene-d10 (Surr)	73		37 - 152	11/08/23 15:25	11/09/23 15:42	1

Client Sample ID: GSSP-MW0034-007.0-20231106

Lab Sample ID: 670-29972-5

Date Collected: 11/06/23 15:01

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 15:20	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	103		40 - 146		11/15/23 15:20	1			
4-Bromofluorobenzene (Surr)	95		41 - 142		11/15/23 15:20	1			
Dibromofluoromethane (Surr)	103		53 - 146		11/15/23 15:20	1			

Client Sample ID: GSSP-MW0035-020.0-20231106

Lab Sample ID: 670-29972-6

Date Collected: 11/06/23 14:35

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 14:53	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	102		40 - 146		11/15/23 14:53	1			
4-Bromofluorobenzene (Surr)	98		41 - 142		11/15/23 14:53	1			
Dibromofluoromethane (Surr)	106		53 - 146		11/15/23 14:53	1			

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.027	U	0.18	0.027	ug/L		11/08/23 15:25	11/09/23 16:04	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
2-methylnaphthalene-d10	93		42 - 157		11/08/23 15:25	11/09/23 16:04	1		
Fluoranthene-d10 (Surr)	63		37 - 152		11/08/23 15:25	11/09/23 16:04	1		

Client Sample ID: GSSP-MW0036-035.0-20231106

Lab Sample ID: 670-29972-7

Date Collected: 11/06/23 14:12

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 15:11	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	99		40 - 146		11/15/23 15:11	1			
4-Bromofluorobenzene (Surr)	98		41 - 142		11/15/23 15:11	1			
Dibromofluoromethane (Surr)	106		53 - 146		11/15/23 15:11	1			

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0044R-030.0-20231106

Lab Sample ID: 670-29972-8

Date Collected: 11/06/23 11:40

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 15:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		40 - 146		11/15/23 15:29	1
4-Bromofluorobenzene (Surr)	97		41 - 142		11/15/23 15:29	1
Dibromofluoromethane (Surr)	105		53 - 146		11/15/23 15:29	1

Client Sample ID: GSSP-MW0053-020.0-20231106

Lab Sample ID: 670-29972-9

Date Collected: 11/06/23 12:53

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	63		5.0	3.6	ug/L			11/15/23 17:40	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		40 - 146		11/15/23 17:40	5
4-Bromofluorobenzene (Surr)	102		41 - 142		11/15/23 17:40	5
Dibromofluoromethane (Surr)	99		53 - 146		11/15/23 17:40	5

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.027	U	0.18	0.027	ug/L		11/08/23 15:25	11/09/23 18:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	95		42 - 157	11/08/23 15:25	11/09/23 18:33	1
Fluoranthene-d10 (Surr)	68		37 - 152	11/08/23 15:25	11/09/23 18:33	1

Client Sample ID: GSSP-MW0059-018.5-20231106

Lab Sample ID: 670-29972-10

Date Collected: 11/06/23 14:51

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 15:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		40 - 146		11/15/23 15:48	1
4-Bromofluorobenzene (Surr)	98		41 - 142		11/15/23 15:48	1
Dibromofluoromethane (Surr)	107		53 - 146		11/15/23 15:48	1

Client Sample ID: GSSP-MW0060-012.5-20231106

Lab Sample ID: 670-29972-11

Date Collected: 11/06/23 13:04

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 16:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		40 - 146		11/15/23 16:06	1
4-Bromofluorobenzene (Surr)	99		41 - 142		11/15/23 16:06	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0060-012.5-20231106

Lab Sample ID: 670-29972-11

Date Collected: 11/06/23 13:04

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	105		53 - 146		11/15/23 16:06	1

Client Sample ID: GSSP-MW0061-018.5-20231106

Lab Sample ID: 670-29972-12

Date Collected: 11/06/23 12:27

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 16:24	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	103		40 - 146		11/15/23 16:24	1			
4-Bromofluorobenzene (Surr)	98		41 - 142		11/15/23 16:24	1			
Dibromofluoromethane (Surr)	107		53 - 146		11/15/23 16:24	1			

Client Sample ID: GSSP-MW0062-012.5-20231106

Lab Sample ID: 670-29972-13

Date Collected: 11/06/23 13:40

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 16:42	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	101		40 - 146		11/15/23 16:42	1			
4-Bromofluorobenzene (Surr)	99		41 - 142		11/15/23 16:42	1			
Dibromofluoromethane (Surr)	105		53 - 146		11/15/23 16:42	1			

Client Sample ID: GSSP-MW0063-018.5-20231106

Lab Sample ID: 670-29972-14

Date Collected: 11/06/23 14:16

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 17:01	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	101		40 - 146		11/15/23 17:01	1			
4-Bromofluorobenzene (Surr)	96		41 - 142		11/15/23 17:01	1			
Dibromofluoromethane (Surr)	109		53 - 146		11/15/23 17:01	1			

Client Sample ID: GSSP-TB-20231106

Lab Sample ID: 670-29972-15

Date Collected: 11/06/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 17:19	1
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
Toluene-d8 (Surr)	101		40 - 146		11/15/23 17:19	1			
4-Bromofluorobenzene (Surr)	98		41 - 142		11/15/23 17:19	1			

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-TB-20231106

Lab Sample ID: 670-29972-15

Date Collected: 11/06/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS (Continued)

<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Dibromofluoromethane (Surr)	103		53 - 146		11/15/23 17:19	1

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		TOL (40-146)	BFB (41-142)	DBFM (53-146)
670-29972-1	GSSP-MW0013-010.0-20231106	102	93	101
670-29972-2 - DL	GSSP-MW0019-020.0-20231106	102	92	101
670-29972-3 - DL	GSSP-MW0020-030.0-20231106	102	94	103
670-29972-3 MS - DL	GSSP-MW0020-030.0-20231106	104	93	103
670-29972-3 MSD - DL	GSSP-MW0020-030.0-20231106	104	94	104
670-29972-4	GSSP-MW0024R-020.0-20231106	101	94	102
670-29972-5	GSSP-MW0034-007.0-20231106	103	95	103
670-29972-6	GSSP-MW0035-020.0-20231106	102	98	106
670-29972-7	GSSP-MW0036-035.0-20231106	99	98	106
670-29972-8	GSSP-MW0044R-030.0-20231106	100	97	105
670-29972-9	GSSP-MW0053-020.0-20231106	103	102	99
670-29972-10	GSSP-MW0059-018.5-20231106	100	98	107
670-29972-11	GSSP-MW0060-012.5-20231106	100	99	105
670-29972-12	GSSP-MW0061-018.5-20231106	103	98	107
670-29972-13	GSSP-MW0062-012.5-20231106	101	99	105
670-29972-14	GSSP-MW0063-018.5-20231106	101	96	109
670-29972-15	GSSP-TB-20231106	101	98	103
670-29990-C-1 MS	Matrix Spike	98	91	101
670-29990-C-1 MSD	Matrix Spike Duplicate	96	92	99
LCS 670-63335/4	Lab Control Sample	99	92	105
LCS 670-63354/4	Lab Control Sample	104	95	102
MB 670-63335/7	Method Blank	101	99	105
MB 670-63354/7	Method Blank	103	96	102

Surrogate Legend

TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		2MN (42-157)	FLN10 (37-152)
670-29972-4	GSSP-MW0024R-020.0-20231106	81	73
670-29972-6	GSSP-MW0035-020.0-20231106	93	63
670-29972-9	GSSP-MW0053-020.0-20231106	95	68

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Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	2MN	FLN10
		(42-157)	(37-152)
LCS 670-62354/2-A	Lab Control Sample	93	101
LCSD 670-62354/3-A	Lab Control Sample Dup	87	91
MB 670-62354/1-A	Method Blank	124	93

Surrogate Legend

2MN = 2-methylnaphthalene-d10

FLN10 = Fluoranthene-d10 (Surr)

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 670-63335/7
Matrix: Water
Analysis Batch: 63335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 11:04	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		40 - 146					11/15/23 11:04	1
4-Bromofluorobenzene (Surr)	99		41 - 142					11/15/23 11:04	1
Dibromofluoromethane (Surr)	105		53 - 146					11/15/23 11:04	1

Lab Sample ID: LCS 670-63335/4
Matrix: Water
Analysis Batch: 63335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	20.0	18.5		ug/L		93	20 - 167
Surrogate	%Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	99		40 - 146				
4-Bromofluorobenzene (Surr)	92		41 - 142				
Dibromofluoromethane (Surr)	105		53 - 146				

Lab Sample ID: 670-29990-C-1 MS
Matrix: Water
Analysis Batch: 63335

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	0.71	U	20.0	17.6		ug/L		88	20 - 167
Surrogate	%Recovery	MS Qualifier	Limits						
Toluene-d8 (Surr)	98		40 - 146						
4-Bromofluorobenzene (Surr)	91		41 - 142						
Dibromofluoromethane (Surr)	101		53 - 146						

Lab Sample ID: 670-29990-C-1 MSD
Matrix: Water
Analysis Batch: 63335

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Vinyl chloride	0.71	U	20.0	17.1		ug/L		85	20 - 167	3	24
Surrogate	%Recovery	MSD Qualifier	Limits								
Toluene-d8 (Surr)	96		40 - 146								
4-Bromofluorobenzene (Surr)	92		41 - 142								
Dibromofluoromethane (Surr)	99		53 - 146								

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 670-63354/7
Matrix: Water
Analysis Batch: 63354

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/15/23 11:12	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		40 - 146					11/15/23 11:12	1
4-Bromofluorobenzene (Surr)	96		41 - 142					11/15/23 11:12	1
Dibromofluoromethane (Surr)	102		53 - 146					11/15/23 11:12	1

Lab Sample ID: LCS 670-63354/4
Matrix: Water
Analysis Batch: 63354

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride	20.0	23.7		ug/L		118	20 - 167
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	104		40 - 146				
4-Bromofluorobenzene (Surr)	95		41 - 142				
Dibromofluoromethane (Surr)	102		53 - 146				

Method: 8260D - Volatile Organic Compounds by GC/MS - DL

Lab Sample ID: 670-29972-3 MS
Matrix: Water
Analysis Batch: 63354

Client Sample ID: GSSP-MW0020-030.0-20231106
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Vinyl chloride - DL	180		500	761		ug/L		116	20 - 167
Surrogate	MS %Recovery	MS Qualifier	Limits						
Toluene-d8 (Surr) - DL	104		40 - 146						
4-Bromofluorobenzene (Surr) - DL	93		41 - 142						
Dibromofluoromethane (Surr) - DL	103		53 - 146						

Lab Sample ID: 670-29972-3 MSD
Matrix: Water
Analysis Batch: 63354

Client Sample ID: GSSP-MW0020-030.0-20231106
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Vinyl chloride - DL	180		500	737		ug/L		111	20 - 167	3	24
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
Toluene-d8 (Surr) - DL	104		40 - 146								
4-Bromofluorobenzene (Surr) - DL	94		41 - 142								
Dibromofluoromethane (Surr) - DL	104		53 - 146								

Eurofins Orlando

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 670-62354/1-A
Matrix: Water
Analysis Batch: 62479

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 62354

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.027	U	0.18	0.027	ug/L	-	11/08/23 15:25	11/09/23 10:44	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	124		42 - 157				11/08/23 15:25	11/09/23 10:44	1
Fluoranthene-d10 (Surr)	93		37 - 152				11/08/23 15:25	11/09/23 10:44	1

Lab Sample ID: LCS 670-62354/2-A
Matrix: Water
Analysis Batch: 62479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 62354

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Naphthalene	3.64	3.76		ug/L	-	103	44 - 166
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
2-methylnaphthalene-d10	93		42 - 157				
Fluoranthene-d10 (Surr)	101		37 - 152				

Lab Sample ID: LCSD 670-62354/3-A
Matrix: Water
Analysis Batch: 62479

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 62354

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Naphthalene	3.64	3.39		ug/L	-	93	44 - 166	10	25
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
2-methylnaphthalene-d10	87		42 - 157						
Fluoranthene-d10 (Surr)	91		37 - 152						

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

GC/MS VOA

Analysis Batch: 63335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29972-6	GSSP-MW0035-020.0-20231106	Total/NA	Water	8260D	
670-29972-7	GSSP-MW0036-035.0-20231106	Total/NA	Water	8260D	
670-29972-8	GSSP-MW0044R-030.0-20231106	Total/NA	Water	8260D	
670-29972-9	GSSP-MW0053-020.0-20231106	Total/NA	Water	8260D	
670-29972-10	GSSP-MW0059-018.5-20231106	Total/NA	Water	8260D	
670-29972-11	GSSP-MW0060-012.5-20231106	Total/NA	Water	8260D	
670-29972-12	GSSP-MW0061-018.5-20231106	Total/NA	Water	8260D	
670-29972-13	GSSP-MW0062-012.5-20231106	Total/NA	Water	8260D	
670-29972-14	GSSP-MW0063-018.5-20231106	Total/NA	Water	8260D	
670-29972-15	GSSP-TB-20231106	Total/NA	Water	8260D	
MB 670-63335/7	Method Blank	Total/NA	Water	8260D	
LCS 670-63335/4	Lab Control Sample	Total/NA	Water	8260D	
670-29990-C-1 MS	Matrix Spike	Total/NA	Water	8260D	
670-29990-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D	

Analysis Batch: 63354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29972-1	GSSP-MW0013-010.0-20231106	Total/NA	Water	8260D	
670-29972-2 - DL	GSSP-MW0019-020.0-20231106	Total/NA	Water	8260D	
670-29972-3 - DL	GSSP-MW0020-030.0-20231106	Total/NA	Water	8260D	
670-29972-4	GSSP-MW0024R-020.0-20231106	Total/NA	Water	8260D	
670-29972-5	GSSP-MW0034-007.0-20231106	Total/NA	Water	8260D	
MB 670-63354/7	Method Blank	Total/NA	Water	8260D	
LCS 670-63354/4	Lab Control Sample	Total/NA	Water	8260D	
670-29972-3 MS - DL	GSSP-MW0020-030.0-20231106	Total/NA	Water	8260D	
670-29972-3 MSD - DL	GSSP-MW0020-030.0-20231106	Total/NA	Water	8260D	

GC/MS Semi VOA

Prep Batch: 62354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29972-4	GSSP-MW0024R-020.0-20231106	Total/NA	Water	3511	
670-29972-6	GSSP-MW0035-020.0-20231106	Total/NA	Water	3511	
670-29972-9	GSSP-MW0053-020.0-20231106	Total/NA	Water	3511	
MB 670-62354/1-A	Method Blank	Total/NA	Water	3511	
LCS 670-62354/2-A	Lab Control Sample	Total/NA	Water	3511	
LCSD 670-62354/3-A	Lab Control Sample Dup	Total/NA	Water	3511	

Analysis Batch: 62479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29972-4	GSSP-MW0024R-020.0-20231106	Total/NA	Water	8270E SIM	62354
670-29972-6	GSSP-MW0035-020.0-20231106	Total/NA	Water	8270E SIM	62354
670-29972-9	GSSP-MW0053-020.0-20231106	Total/NA	Water	8270E SIM	62354
MB 670-62354/1-A	Method Blank	Total/NA	Water	8270E SIM	62354
LCS 670-62354/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	62354
LCSD 670-62354/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	62354

Eurofins Orlando

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0013-010.0-20231106

Lab Sample ID: 670-29972-1

Date Collected: 11/06/23 15:24

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63354	KG	EET ORL	11/15/23 15:38

Client Sample ID: GSSP-MW0019-020.0-20231106

Lab Sample ID: 670-29972-2

Date Collected: 11/06/23 11:49

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D	DL	10	63354	KG	EET ORL	11/15/23 18:24

Client Sample ID: GSSP-MW0020-030.0-20231106

Lab Sample ID: 670-29972-3

Date Collected: 11/06/23 12:13

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D	DL	25	63354	KG	EET ORL	11/15/23 11:48

Client Sample ID: GSSP-MW0024R-020.0-20231106

Lab Sample ID: 670-29972-4

Date Collected: 11/06/23 13:28

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63354	KG	EET ORL	11/15/23 15:03
Total/NA	Prep	3511			62354	BR	EET ORL	11/08/23 15:25
Total/NA	Analysis	8270E SIM		1	62479	JI	EET ORL	11/09/23 15:42

Client Sample ID: GSSP-MW0034-007.0-20231106

Lab Sample ID: 670-29972-5

Date Collected: 11/06/23 15:01

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63354	KG	EET ORL	11/15/23 15:20

Client Sample ID: GSSP-MW0035-020.0-20231106

Lab Sample ID: 670-29972-6

Date Collected: 11/06/23 14:35

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 14:53
Total/NA	Prep	3511			62354	BR	EET ORL	11/08/23 15:25
Total/NA	Analysis	8270E SIM		1	62479	JI	EET ORL	11/09/23 16:04

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0036-035.0-20231106

Lab Sample ID: 670-29972-7

Date Collected: 11/06/23 14:12

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 15:11

Client Sample ID: GSSP-MW0044R-030.0-20231106

Lab Sample ID: 670-29972-8

Date Collected: 11/06/23 11:40

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 15:29

Client Sample ID: GSSP-MW0053-020.0-20231106

Lab Sample ID: 670-29972-9

Date Collected: 11/06/23 12:53

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		5	63335	AAM	EET ORL	11/15/23 17:40
Total/NA	Prep	3511			62354	BR	EET ORL	11/08/23 15:25
Total/NA	Analysis	8270E SIM		1	62479	JI	EET ORL	11/09/23 18:33

Client Sample ID: GSSP-MW0059-018.5-20231106

Lab Sample ID: 670-29972-10

Date Collected: 11/06/23 14:51

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 15:48

Client Sample ID: GSSP-MW0060-012.5-20231106

Lab Sample ID: 670-29972-11

Date Collected: 11/06/23 13:04

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 16:06

Client Sample ID: GSSP-MW0061-018.5-20231106

Lab Sample ID: 670-29972-12

Date Collected: 11/06/23 12:27

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 16:24

Client Sample ID: GSSP-MW0062-012.5-20231106

Lab Sample ID: 670-29972-13

Date Collected: 11/06/23 13:40

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 16:42

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Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Client Sample ID: GSSP-MW0063-018.5-20231106

Lab Sample ID: 670-29972-14

Date Collected: 11/06/23 14:16

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 17:01

Client Sample ID: GSSP-TB-20231106

Lab Sample ID: 670-29972-15

Date Collected: 11/06/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63335	AAM	EET ORL	11/15/23 17:19

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984



Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

- 1
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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET ORL
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	EET ORL
3511	Microextraction of Organic Compounds	SW846	EET ORL
5030C	Purge and Trap	SW846	EET ORL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984



Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - GSSP

Job ID: 670-29972-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-29972-1	GSSP-MW0013-010.0-20231106	Water	11/06/23 15:24	11/07/23 15:00
670-29972-2	GSSP-MW0019-020.0-20231106	Water	11/06/23 11:49	11/07/23 15:00
670-29972-3	GSSP-MW0020-030.0-20231106	Water	11/06/23 12:13	11/07/23 15:00
670-29972-4	GSSP-MW0024R-020.0-20231106	Water	11/06/23 13:28	11/07/23 15:00
670-29972-5	GSSP-MW0034-007.0-20231106	Water	11/06/23 15:01	11/07/23 15:00
670-29972-6	GSSP-MW0035-020.0-20231106	Water	11/06/23 14:35	11/07/23 15:00
670-29972-7	GSSP-MW0036-035.0-20231106	Water	11/06/23 14:12	11/07/23 15:00
670-29972-8	GSSP-MW0044R-030.0-20231106	Water	11/06/23 11:40	11/07/23 15:00
670-29972-9	GSSP-MW0053-020.0-20231106	Water	11/06/23 12:53	11/07/23 15:00
670-29972-10	GSSP-MW0059-018.5-20231106	Water	11/06/23 14:51	11/07/23 15:00
670-29972-11	GSSP-MW0060-012.5-20231106	Water	11/06/23 13:04	11/07/23 15:00
670-29972-12	GSSP-MW0061-018.5-20231106	Water	11/06/23 12:27	11/07/23 15:00
670-29972-13	GSSP-MW0062-012.5-20231106	Water	11/06/23 13:40	11/07/23 15:00
670-29972-14	GSSP-MW0063-018.5-20231106	Water	11/06/23 14:16	11/07/23 15:00
670-29972-15	GSSP-TB-20231106	Water	11/06/23 08:00	11/07/23 15:00

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CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD								COC No.		Page: 1 of 2		
Project Name: NASA KSC - Industrial Area				PO No. 148674				Project No. 60610905.Subs 2021-23-Subs 2021-23				
Site Location: General Services Administration Seized Property				Send Invoice To: Instructions in MSA # 195-24548-GV03				EDD to: Jennifer Chastain Cc: Teresa Amentt Jennings				
TO No.: 80KSC019F0071		AECOM Project Manager: Chris Marshall cc: Greg Kusel		Deliver Sample Kits To: AECOM Depot, 523 18th Street, Orlando				Report to: Jennifer Chastain Cc: Teresa Amentt Jennings				
Sampler/Phone #		Greg Kusel / (772) 631-7426		Dustin Slater / (407) 766-0747		Deliver Samples To: Eurofins Orlando				Site-Specific WS#15 from QAPP: 15-12		
Lab Name: Eurofins		Turnaround Time(specify):		Standard 14 day		Sample Analysis Requested (Enter number of containers for each test)						
Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (YYYYMMDD)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	G=Grab C=Comp	(3)	HCl	4 DEG C	Comments	
	GSSP-MW0013-0100-20231106	GSSP-MW0013	20231106	1524	WG	N	G	3	3			
	GSSP-MW0019-020.0-20231106	GSSP-MW0019	20231106	1149	WG	N	G	3	3			
	GSSP-MW0020-030.0-20231106	GSSP-MW0020	20231106	1213	WG	N	G	3	3			
	GSSP-MW0024R-020.0-20231106	GSSP-MW0024R	20231106	1328	WG	N	G	5	3	2		
	GSSP-MW0034-0070-20231106	GSSP-MW0034	20231106	1501	WG	N	G	3	3			
	GSSP-MW0035-020.0-20231106	GSSP-MW0035	20231106	1435	WG	N	G	5	3	2		
	GSSP-MW0036-035.0-20231106	GSSP-MW0036	20231106	1412	WG	N	G	3	3			
	GSSP-MW0044R-030.0-20231106	GSSP-MW0044R	20231106	1140	WG	N	G	3	3			
	GSSP-MW0053-020.0-20231106	GSSP-MW0053	20231106	1253	WG	N	G	3	3			
	GSSP-MW0059-018.5-20231106	GSSP-MW0059	20231106	1451	WG	N	G	3	3			
	GSSP-MW0060-012.5-20231106	GSSP-MW0060	20231106	1304	WG	N	G	3	3			
	GSSP-MW0061-018.5-20231106	GSSP-MW0061	20231106	1227	WG	N	G	3	3			



670-29972 Chain of Custody

Field Comments: Report only per QAPP WS #15-12			Lab Comments: SO 12998			Sample Shipment and Delivery Details		
Relinquished by (signature) <i>[Signature]</i> Date <i>11/21/23</i> Time <i>1503</i>			Received by (signature) <i>[Signature]</i> Date <i>7/11/1900</i> Time			Number of coolers in shipment:		
1			2			Samples Iced?(check) Yes <input type="checkbox"/> No <input type="checkbox"/>		
2			3			Shipping Company:		
3						Tracking No:		
						Date Shipped:		

(1) AA=Ambient air, AQ=Air quality control, ASB=Asbestos, CK=Caulk, DS=Storm drain sediment, GS=Soil gas, IC=IDW Concrete, IDD=IDW Solid, IDS=IDW soil, IDW=IDW Water, LF=Free Product, MA=Mastic, PC=Paint Chips, SC=Cement/Concrete, SE=Sediment, SL=Sludge, SO=Soil, SQ=Soil/Solid quality control, SSD=Subsurface sediment, SU=Surface soil (<6 in), SW=Swab or wipe, TA=Animal tissue, TP=Plant tissue, TQ=Tissue quality control, WG=Ground water, WL=Leachate, WO=Ocean water, WP=Drinking water, WQ=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Waste water

(2) Sample Type: AB=Ambient Blk, EB=Equipment Blk, FB=Field Blk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Blk

(3) Preservative added: 4 DEG C=Cool to 4 degrees, Dark=Store in Darkness, store cool at 4 degrees C H2SO4=Hydrogen sulfate, H2SO4 <2=Adjust to pH < 2 with sulfuric acid, H3PO4=Phosphoric acid, H3PO4 <2=Adjust to pH <2 with phosphoric acid, HCl <2=Adjust to pH < 2 with hydrochloric acid, HNaO4S=Sodium bisulfate preservation, HNO3 <2=Adjust to pH < 2 with nitric acid, MeOH=Methanol preservation, Na2O3S2=3/gal=Add 3 mL 10% sodium thiosulfate per l-gal, Na2O3S2 4/4oz=4 drops of 10% sodium thiosulfate to 4 oz, NaHSO4 <2=Adjust to pH < 2 with sodium hydrogen sulfate, NaOH >12=Adjust to pH > 12 with sodium hydroxide, NaOH >9=Adjust to pH >9 with sodium hydroxide, VitC 0.6/500=0.6 g of ascorbic acid to 500mLs, ZnAct 2/500=Add 2 mL of zinc acetate to 500mLs, ZnAct+NaOH >9=Zinc acetate and NaOH to pH>9; store cool at 4C. If NO preservative added leave blank

Rev 8/19 *11.7/11.5*

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD								COC No.		Page: 2 of 2	
Project Name: NASA KSC - Industrial Area				PO No. 148674				Project No. 60610905.Subs 2021-23-Subs 2021-23		Phase:	
Site Location: General Services Administration Seized Property				Send Invoice To: Instructions in MSA # 19S-24548-GV03				EDD to: Jennifer Chastain Cc: Teresa Amentt Jennings			
TO No.: 80KSC019F0071		AECOM Project Manager: Chris Marshall cc: Greg Kusel		Deliver Sample Kits To: AECOM Depot, 523 18th Street, Orlando				Report to: Jennifer Chastain Cc: Teresa Amentt Jennings			
Sampler/Phone #		Greg Kusel / (772) 631-7426		Dustin Slater / (407) 766-0747		Deliver Samples To: Eurofins Orlando				Site-Specific WS#15 from QAPP: 15-12	
Lab Name: Eurofins		Turnaround Time(specify):		Standard 14 day		Sample Analysis Requested (Enter number of containers for each test)					
Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (YYYYMMDD)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	G=Grab C=Comp	(3)	HCl	4 DEG C	Comments
	GSSP-MW0062-012.5-20231106	GSSP-MW0062	20231106	1340	WG	N	G	3	3		
	GSSP-MW0063-018.5-20231106	GSSP-MW0063	20231106	1416	WG	N	G	3	3		
	GSSP-TB-20231106	GSSP-TB	20231106	0800	WQ	TB	G	2	2		

Field Comments: Report only per QAPP WS #15-12			Lab Comments: SO 12998			Sample Shipment and Delivery Details		
Relinquished by (signature) <i>[Signature]</i> Date 11/7/23 Time 1503			Received by (signature) <i>[Signature]</i> Date 11/7 Time 1500			Number of coolers in shipment:		
1			2			Samples Iced?(check) Yes ___ No ___		
2			3			Shipping Company:		
						Tracking No:		
						Date Shipped:		

(1) AA=Ambient air, AQ=Air quality control, ASB=Asbestos, CK=Caulk, DS=Storm drain sediment, GS=Soil gas, IC=IDW Concrete, IDD=IDW Solid, IDS=IDW soil, IDW=IDW Water, LF=Free Product, MA=Mastic, PC=Paint Chips, SC=Cement/Concrete, SE=Sediment, SL=Sludge, SO=Soil, SQ=Soil/Solid quality control, SSD=Subsurface sediment, SU=Surface soil (<6 in), SW=Swab or wipe, TA=Animal tissue, TP=Plant tissue, TQ=Tissue quality control, WG=Ground water, WL=Leachate, WO=Ocean water, WP=Drinking water, WQ=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Waste water

(2) Sample Type: AB=Ambient Blk, EB=Equipment Blk, FB=Field Blk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Blk

(3) Preservative added: 4 DEG C=Cool to 4 degrees, Dark=Store in Darkness, store cool at 4 degrees C H2SO4=Hydrogen sulfate, H2SO4 <2=Adjust to pH < 2 with sulfuric acid, H3PO4=Phosphoric acid, H3PO4 <2=Adjust to pH <2 with phosphoric acid, HCl <2=Adjust to pH < 2 with hydrochloric acid, HNaO4S=Sodium bisulfate preservation, HNO3 <2=Adjust to pH < 2 with nitric acid, MeOH=Methanol preservation, Na2O3S2=Sodium thiosulfate, Na2O3S2 3/gal=Add 3 mL 10% sodium thiosulfate per 1-gal, Na2O3S2 4/4oz=4 drops of 10% sodium thiosulfate to 4 oz, NaHSO4 <2=Adjust to pH < 2 with sodium hydrogen sulfate, NaOH >12=Adjust to pH > 12 with sodium hydroxide, NaOH >9=Adjust to pH >9 with sodium hydroxide, VitC 0.6/500=0.6 g of ascorbic acid to 500mLs, ZnAct 2/500=Add 2 mL of zinc acetate to 500mLs, ZnAct+NaOH >9=Zinc acetate and NaOH to pH>9; store cool at 4C. IF NO preservative added leave blank

Rev 8/19

11, 7/11, 5

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-29972-1

Login Number: 29972

List Number: 1

Creator: Bittle, David W

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 11/16/2023 12:48:38 PM

JOB DESCRIPTION

NASA KSC IA - FSA #1 UST

JOB NUMBER

670-29970-1

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984



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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Job ID: 670-29970-1

Laboratory: Eurofins Orlando

Narrative

**Job Narrative
670-29970-1**

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method. Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 11/7/2023 3:00 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 11.5°C

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.



Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0001-005.0-20231107

Lab Sample ID: 670-29970-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Isopropylbenzene	16		2.0	0.67	ug/L	1		8260D	Total/NA
1-Methylnaphthalene	15		0.18	0.032	ug/L	1		8270E SIM	Total/NA
2-Methylnaphthalene	14		0.18	0.039	ug/L	1		8270E SIM	Total/NA

Client Sample ID: FSA1-MW0002-004.5-20231107

Lab Sample ID: 670-29970-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	0.038	I	0.18	0.032	ug/L	1		8270E SIM	Total/NA

Client Sample ID: FSA1-MW0012R-005.5-20231107

Lab Sample ID: 670-29970-3

No Detections.

Client Sample ID: FSA1-MW0014-005.5-20231107

Lab Sample ID: 670-29970-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	0.11	I	0.18	0.032	ug/L	1		8270E SIM	Total/NA
2-Methylnaphthalene	0.044	I	0.18	0.039	ug/L	1		8270E SIM	Total/NA

Client Sample ID: FSA1-MW0017A-005.5-20231107

Lab Sample ID: 670-29970-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Isopropylbenzene	4.0		2.0	0.67	ug/L	1		8260D	Total/NA

Client Sample ID: FSA1-MW0021-004.0-20231107

Lab Sample ID: 670-29970-6

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Isopropylbenzene	2.1		2.0	0.67	ug/L	1		8260D	Total/NA
1-Methylnaphthalene	0.84		0.18	0.032	ug/L	1		8270E SIM	Total/NA

Client Sample ID: FSA1-MW0022R-005.5-20231107

Lab Sample ID: 670-29970-7

No Detections.

Client Sample ID: FSA1-MW0023-005.0-20231107

Lab Sample ID: 670-29970-8

No Detections.

Client Sample ID: FSA1-MW0027-020.0-20231107

Lab Sample ID: 670-29970-9

No Detections.

Client Sample ID: FSA1-MW0028-020.0-20231107

Lab Sample ID: 670-29970-10

No Detections.

Client Sample ID: FSA1-TB-20231107

Lab Sample ID: 670-29970-11

No Detections.

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0001-005.0-20231107

Lab Sample ID: 670-29970-1

Date Collected: 11/07/23 11:14

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	16		2.0	0.67	ug/L			11/15/23 14:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		40 - 146					11/15/23 14:10	1
4-Bromofluorobenzene (Surr)	99		41 - 142					11/15/23 14:10	1
Dibromofluoromethane (Surr)	98		53 - 146					11/15/23 14:10	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	15		0.18	0.032	ug/L		11/09/23 10:14	11/10/23 11:46	1
2-Methylnaphthalene	14		0.18	0.039	ug/L		11/09/23 10:14	11/10/23 11:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	110		42 - 157				11/09/23 10:14	11/10/23 11:46	1
Fluoranthene-d10 (Surr)	96		37 - 152				11/09/23 10:14	11/10/23 11:46	1

Client Sample ID: FSA1-MW0002-004.5-20231107

Lab Sample ID: 670-29970-2

Date Collected: 11/07/23 11:38

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 14:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		40 - 146					11/15/23 14:28	1
4-Bromofluorobenzene (Surr)	104		41 - 142					11/15/23 14:28	1
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 14:28	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.038	I	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 12:08	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 12:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	106		42 - 157				11/09/23 10:14	11/10/23 12:08	1
Fluoranthene-d10 (Surr)	85		37 - 152				11/09/23 10:14	11/10/23 12:08	1

Client Sample ID: FSA1-MW0012R-005.5-20231107

Lab Sample ID: 670-29970-3

Date Collected: 11/07/23 10:41

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 14:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		40 - 146					11/15/23 14:45	1
4-Bromofluorobenzene (Surr)	103		41 - 142					11/15/23 14:45	1
Dibromofluoromethane (Surr)	100		53 - 146					11/15/23 14:45	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0012R-005.5-20231107

Lab Sample ID: 670-29970-3

Date Collected: 11/07/23 10:41

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 12:29	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 12:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	95		42 - 157				11/09/23 10:14	11/10/23 12:29	1
Fluoranthene-d10 (Surr)	108		37 - 152				11/09/23 10:14	11/10/23 12:29	1

Client Sample ID: FSA1-MW0014-005.5-20231107

Lab Sample ID: 670-29970-4

Date Collected: 11/07/23 10:11

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 15:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		40 - 146					11/15/23 15:03	1
4-Bromofluorobenzene (Surr)	107		41 - 142					11/15/23 15:03	1
Dibromofluoromethane (Surr)	100		53 - 146					11/15/23 15:03	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.11	I	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 12:50	1
2-Methylnaphthalene	0.044	I	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 12:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	85		42 - 157				11/09/23 10:14	11/10/23 12:50	1
Fluoranthene-d10 (Surr)	88		37 - 152				11/09/23 10:14	11/10/23 12:50	1

Client Sample ID: FSA1-MW0017A-005.5-20231107

Lab Sample ID: 670-29970-5

Date Collected: 11/07/23 12:19

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	4.0		2.0	0.67	ug/L			11/15/23 15:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		40 - 146					11/15/23 15:20	1
4-Bromofluorobenzene (Surr)	102		41 - 142					11/15/23 15:20	1
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 15:20	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 13:12	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 13:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	74		42 - 157				11/09/23 10:14	11/10/23 13:12	1
Fluoranthene-d10 (Surr)	88		37 - 152				11/09/23 10:14	11/10/23 13:12	1

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0021-004.0-20231107

Lab Sample ID: 670-29970-6

Date Collected: 11/07/23 12:00

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	2.1		2.0	0.67	ug/L			11/15/23 15:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		40 - 146					11/15/23 15:38	1
4-Bromofluorobenzene (Surr)	102		41 - 142					11/15/23 15:38	1
Dibromofluoromethane (Surr)	102		53 - 146					11/15/23 15:38	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.84		0.18	0.032	ug/L		11/09/23 10:14	11/10/23 13:33	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 13:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	92		42 - 157				11/09/23 10:14	11/10/23 13:33	1
Fluoranthene-d10 (Surr)	70		37 - 152				11/09/23 10:14	11/10/23 13:33	1

Client Sample ID: FSA1-MW0022R-005.5-20231107

Lab Sample ID: 670-29970-7

Date Collected: 11/07/23 10:59

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 15:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		40 - 146					11/15/23 15:55	1
4-Bromofluorobenzene (Surr)	105		41 - 142					11/15/23 15:55	1
Dibromofluoromethane (Surr)	100		53 - 146					11/15/23 15:55	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 13:54	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 13:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	94		42 - 157				11/09/23 10:14	11/10/23 13:54	1
Fluoranthene-d10 (Surr)	111		37 - 152				11/09/23 10:14	11/10/23 13:54	1

Client Sample ID: FSA1-MW0023-005.0-20231107

Lab Sample ID: 670-29970-8

Date Collected: 11/07/23 11:32

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 16:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	94		40 - 146					11/15/23 16:13	1
4-Bromofluorobenzene (Surr)	104		41 - 142					11/15/23 16:13	1
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 16:13	1

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0023-005.0-20231107

Lab Sample ID: 670-29970-8

Date Collected: 11/07/23 11:32

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 14:15	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 14:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	83		42 - 157				11/09/23 10:14	11/10/23 14:15	1
Fluoranthene-d10 (Surr)	102		37 - 152				11/09/23 10:14	11/10/23 14:15	1

Client Sample ID: FSA1-MW0027-020.0-20231107

Lab Sample ID: 670-29970-9

Date Collected: 11/07/23 10:25

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 16:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		40 - 146					11/15/23 16:30	1
4-Bromofluorobenzene (Surr)	102		41 - 142					11/15/23 16:30	1
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 16:30	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 14:37	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 14:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	84		42 - 157				11/09/23 10:14	11/10/23 14:37	1
Fluoranthene-d10 (Surr)	111		37 - 152				11/09/23 10:14	11/10/23 14:37	1

Client Sample ID: FSA1-MW0028-020.0-20231107

Lab Sample ID: 670-29970-10

Date Collected: 11/07/23 09:58

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 16:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		40 - 146					11/15/23 16:48	1
4-Bromofluorobenzene (Surr)	106		41 - 142					11/15/23 16:48	1
Dibromofluoromethane (Surr)	101		53 - 146					11/15/23 16:48	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 14:58	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 14:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	112		42 - 157				11/09/23 10:14	11/10/23 14:58	1
Fluoranthene-d10 (Surr)	102		37 - 152				11/09/23 10:14	11/10/23 14:58	1

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Client Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-TB-20231107

Lab Sample ID: 670-29970-11

Date Collected: 11/07/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 12:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		40 - 146		11/15/23 12:43	1
4-Bromofluorobenzene (Surr)	104		41 - 142		11/15/23 12:43	1
Dibromofluoromethane (Surr)	101		53 - 146		11/15/23 12:43	1

Surrogate Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		TOL (40-146)	BFB (41-142)	DBFM (53-146)
400-246337-B-1 MS	Matrix Spike	98	103	99
400-246337-B-1 MSD	Matrix Spike Duplicate	98	106	100
670-29970-1	FSA1-MW0001-005.0-2023110 7	96	99	98
670-29970-2	FSA1-MW0002-004.5-2023110 7	97	104	101
670-29970-3	FSA1-MW0012R-005.5-2023110 07	96	103	100
670-29970-4	FSA1-MW0014-005.5-2023110 7	96	107	100
670-29970-5	FSA1-MW0017A-005.5-2023110 07	97	102	101
670-29970-6	FSA1-MW0021-004.0-2023110 7	98	102	102
670-29970-7	FSA1-MW0022R-005.5-2023110 07	98	105	100
670-29970-8	FSA1-MW0023-005.0-2023110 7	94	104	101
670-29970-9	FSA1-MW0027-020.0-2023110 7	98	102	101
670-29970-10	FSA1-MW0028-020.0-2023110 7	96	106	101
670-29970-11	FSA1-TB-20231107	96	104	101
LCS 670-63342/5	Lab Control Sample	98	103	100
MB 670-63342/8	Method Blank	95	108	99

Surrogate Legend

- TOL = Toluene-d8 (Surr)
- BFB = 4-Bromofluorobenzene (Surr)
- DBFM = Dibromofluoromethane (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		2MN (42-157)	FLN10 (37-152)
670-29970-1	FSA1-MW0001-005.0-20231107	110	96
670-29970-2	FSA1-MW0002-004.5-2023110 7	106	85
670-29970-3	FSA1-MW0012R-005.5-2023110 07	95	108
670-29970-4	FSA1-MW0014-005.5-2023110 7	85	88
670-29970-5	FSA1-MW0017A-005.5-2023110 07	74	88
670-29970-6	FSA1-MW0021-004.0-2023110 7	92	70
670-29970-7	FSA1-MW0022R-005.5-2023110 07	94	111
670-29970-8	FSA1-MW0023-005.0-2023110 7	83	102
670-29970-9	FSA1-MW0027-020.0-2023110 7	84	111

Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	2MN	FLN10
		(42-157)	(37-152)
670-29970-10	FSA1-MW0028-020.0-20231107	112	102
LCS 670-62517/2-A	Lab Control Sample	88	101
LCSD 670-62517/3-A	Lab Control Sample Dup	100	107
MB 670-62517/1-A	Method Blank	97	108

Surrogate Legend

2MN = 2-methylnaphthalene-d10

FLN10 = Fluoranthene-d10 (Surr)

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 670-63342/8

Matrix: Water

Analysis Batch: 63342

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/15/23 11:10	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		40 - 146					11/15/23 11:10	1
4-Bromofluorobenzene (Surr)	108		41 - 142					11/15/23 11:10	1
Dibromofluoromethane (Surr)	99		53 - 146					11/15/23 11:10	1

Lab Sample ID: LCS 670-63342/5

Matrix: Water

Analysis Batch: 63342

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Isopropylbenzene	20.0	21.3		ug/L		107	60 - 132
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	98		40 - 146				
4-Bromofluorobenzene (Surr)	103		41 - 142				
Dibromofluoromethane (Surr)	100		53 - 146				

Lab Sample ID: 400-246337-B-1 MS

Matrix: Water

Analysis Batch: 63342

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Isopropylbenzene	67	U	2000	2070		ug/L		103	60 - 132
Surrogate	MS %Recovery	MS Qualifier	Limits						
Toluene-d8 (Surr)	98		40 - 146						
4-Bromofluorobenzene (Surr)	103		41 - 142						
Dibromofluoromethane (Surr)	99		53 - 146						

Lab Sample ID: 400-246337-B-1 MSD

Matrix: Water

Analysis Batch: 63342

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Isopropylbenzene	67	U	2000	2190		ug/L		110	60 - 132	6	23
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
Toluene-d8 (Surr)	98		40 - 146								
4-Bromofluorobenzene (Surr)	106		41 - 142								
Dibromofluoromethane (Surr)	100		53 - 146								

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 670-62517/1-A

Matrix: Water

Analysis Batch: 62710

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 62517

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 11:25	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 11:25	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
2-methylnaphthalene-d10	97		42 - 157				11/09/23 10:14	11/10/23 11:25	1
Fluoranthene-d10 (Surr)	108		37 - 152				11/09/23 10:14	11/10/23 11:25	1

Lab Sample ID: LCS 670-62517/2-A

Matrix: Water

Analysis Batch: 62710

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 62517

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
1-Methylnaphthalene	3.64	3.12		ug/L		86	45 - 148		
2-Methylnaphthalene	3.64	2.82		ug/L		78	41 - 146		
Surrogate	LCS LCS		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
2-methylnaphthalene-d10	88		42 - 157						
Fluoranthene-d10 (Surr)	101		37 - 152						

Lab Sample ID: LCSD 670-62517/3-A

Matrix: Water

Analysis Batch: 62710

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 62517

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits		RPD	
									RPD	Limit
1-Methylnaphthalene	3.64	2.72		ug/L		75	45 - 148	14	25	
2-Methylnaphthalene	3.64	2.48		ug/L		68	41 - 146	13	25	
Surrogate	LCSD LCSD		Limits			D	Prepared	Analyzed	Dil Fac	
%Recovery	Qualifier									
2-methylnaphthalene-d10	100		42 - 157							
Fluoranthene-d10 (Surr)	107		37 - 152							

QC Association Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

GC/MS VOA

Analysis Batch: 63342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29970-1	FSA1-MW0001-005.0-20231107	Total/NA	Water	8260D	
670-29970-2	FSA1-MW0002-004.5-20231107	Total/NA	Water	8260D	
670-29970-3	FSA1-MW0012R-005.5-20231107	Total/NA	Water	8260D	
670-29970-4	FSA1-MW0014-005.5-20231107	Total/NA	Water	8260D	
670-29970-5	FSA1-MW0017A-005.5-20231107	Total/NA	Water	8260D	
670-29970-6	FSA1-MW0021-004.0-20231107	Total/NA	Water	8260D	
670-29970-7	FSA1-MW0022R-005.5-20231107	Total/NA	Water	8260D	
670-29970-8	FSA1-MW0023-005.0-20231107	Total/NA	Water	8260D	
670-29970-9	FSA1-MW0027-020.0-20231107	Total/NA	Water	8260D	
670-29970-10	FSA1-MW0028-020.0-20231107	Total/NA	Water	8260D	
670-29970-11	FSA1-TB-20231107	Total/NA	Water	8260D	
MB 670-63342/8	Method Blank	Total/NA	Water	8260D	
LCS 670-63342/5	Lab Control Sample	Total/NA	Water	8260D	
400-246337-B-1 MS	Matrix Spike	Total/NA	Water	8260D	
400-246337-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D	

GC/MS Semi VOA

Prep Batch: 62517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29970-1	FSA1-MW0001-005.0-20231107	Total/NA	Water	3511	
670-29970-2	FSA1-MW0002-004.5-20231107	Total/NA	Water	3511	
670-29970-3	FSA1-MW0012R-005.5-20231107	Total/NA	Water	3511	
670-29970-4	FSA1-MW0014-005.5-20231107	Total/NA	Water	3511	
670-29970-5	FSA1-MW0017A-005.5-20231107	Total/NA	Water	3511	
670-29970-6	FSA1-MW0021-004.0-20231107	Total/NA	Water	3511	
670-29970-7	FSA1-MW0022R-005.5-20231107	Total/NA	Water	3511	
670-29970-8	FSA1-MW0023-005.0-20231107	Total/NA	Water	3511	
670-29970-9	FSA1-MW0027-020.0-20231107	Total/NA	Water	3511	
670-29970-10	FSA1-MW0028-020.0-20231107	Total/NA	Water	3511	
MB 670-62517/1-A	Method Blank	Total/NA	Water	3511	
LCS 670-62517/2-A	Lab Control Sample	Total/NA	Water	3511	
LCSD 670-62517/3-A	Lab Control Sample Dup	Total/NA	Water	3511	

Analysis Batch: 62710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29970-1	FSA1-MW0001-005.0-20231107	Total/NA	Water	8270E SIM	62517
670-29970-2	FSA1-MW0002-004.5-20231107	Total/NA	Water	8270E SIM	62517
670-29970-3	FSA1-MW0012R-005.5-20231107	Total/NA	Water	8270E SIM	62517
670-29970-4	FSA1-MW0014-005.5-20231107	Total/NA	Water	8270E SIM	62517
670-29970-5	FSA1-MW0017A-005.5-20231107	Total/NA	Water	8270E SIM	62517
670-29970-6	FSA1-MW0021-004.0-20231107	Total/NA	Water	8270E SIM	62517
670-29970-7	FSA1-MW0022R-005.5-20231107	Total/NA	Water	8270E SIM	62517
670-29970-8	FSA1-MW0023-005.0-20231107	Total/NA	Water	8270E SIM	62517
670-29970-9	FSA1-MW0027-020.0-20231107	Total/NA	Water	8270E SIM	62517
670-29970-10	FSA1-MW0028-020.0-20231107	Total/NA	Water	8270E SIM	62517
MB 670-62517/1-A	Method Blank	Total/NA	Water	8270E SIM	62517
LCS 670-62517/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	62517
LCSD 670-62517/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	62517

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0001-005.0-20231107

Lab Sample ID: 670-29970-1

Date Collected: 11/07/23 11:14

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 14:10
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 11:46

Client Sample ID: FSA1-MW0002-004.5-20231107

Lab Sample ID: 670-29970-2

Date Collected: 11/07/23 11:38

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 14:28
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 12:08

Client Sample ID: FSA1-MW0012R-005.5-20231107

Lab Sample ID: 670-29970-3

Date Collected: 11/07/23 10:41

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 14:45
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 12:29

Client Sample ID: FSA1-MW0014-005.5-20231107

Lab Sample ID: 670-29970-4

Date Collected: 11/07/23 10:11

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 15:03
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 12:50

Client Sample ID: FSA1-MW0017A-005.5-20231107

Lab Sample ID: 670-29970-5

Date Collected: 11/07/23 12:19

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 15:20
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 13:12

Client Sample ID: FSA1-MW0021-004.0-20231107

Lab Sample ID: 670-29970-6

Date Collected: 11/07/23 12:00

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 15:38

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Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Client Sample ID: FSA1-MW0021-004.0-20231107

Lab Sample ID: 670-29970-6

Date Collected: 11/07/23 12:00

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 13:33

Client Sample ID: FSA1-MW0022R-005.5-20231107

Lab Sample ID: 670-29970-7

Date Collected: 11/07/23 10:59

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 15:55
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 13:54

Client Sample ID: FSA1-MW0023-005.0-20231107

Lab Sample ID: 670-29970-8

Date Collected: 11/07/23 11:32

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 16:13
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 14:15

Client Sample ID: FSA1-MW0027-020.0-20231107

Lab Sample ID: 670-29970-9

Date Collected: 11/07/23 10:25

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 16:30
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 14:37

Client Sample ID: FSA1-MW0028-020.0-20231107

Lab Sample ID: 670-29970-10

Date Collected: 11/07/23 09:58

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 16:48
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 14:58

Client Sample ID: FSA1-TB-20231107

Lab Sample ID: 670-29970-11

Date Collected: 11/07/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63342	KG	EET ORL	11/15/23 12:43

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

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Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET ORL
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	EET ORL
3511	Microextraction of Organic Compounds	SW846	EET ORL
5030C	Purge and Trap	SW846	EET ORL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984



Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC IA - FSA #1 UST

Job ID: 670-29970-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-29970-1	FSA1-MW0001-005.0-20231107	Water	11/07/23 11:14	11/07/23 15:00
670-29970-2	FSA1-MW0002-004.5-20231107	Water	11/07/23 11:38	11/07/23 15:00
670-29970-3	FSA1-MW0012R-005.5-20231107	Water	11/07/23 10:41	11/07/23 15:00
670-29970-4	FSA1-MW0014-005.5-20231107	Water	11/07/23 10:11	11/07/23 15:00
670-29970-5	FSA1-MW0017A-005.5-20231107	Water	11/07/23 12:19	11/07/23 15:00
670-29970-6	FSA1-MW0021-004.0-20231107	Water	11/07/23 12:00	11/07/23 15:00
670-29970-7	FSA1-MW0022R-005.5-20231107	Water	11/07/23 10:59	11/07/23 15:00
670-29970-8	FSA1-MW0023-005.0-20231107	Water	11/07/23 11:32	11/07/23 15:00
670-29970-9	FSA1-MW0027-020.0-20231107	Water	11/07/23 10:25	11/07/23 15:00
670-29970-10	FSA1-MW0028-020.0-20231107	Water	11/07/23 09:58	11/07/23 15:00
670-29970-11	FSA1-TB-20231107	Water	11/07/23 08:00	11/07/23 15:00

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Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-29970-1

Login Number: 29970

List Number: 1

Creator: Bittle, David W

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



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ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 11/29/2023 8:23:19 AM

JOB DESCRIPTION

NASA KSC Industrial Area IDW

JOB NUMBER

670-29971-1

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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11/29/2023 8:23:19 AM

Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984



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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

HPLC/IC

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

LCMS

Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)

Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Job ID: 670-29971-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-29971-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method. Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 11/7/2023 3:00 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 11.5°C

GC/MS VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PFAS

Method PFC_IDA: The recovery for the labeled isotope: M2-8:2 FTS in the following sample: IA-IDW01-20231107 (670-29971-1) is outside the QC acceptance limits. Since the recovery is high and the native analyte is not detected in the sample, the data is reported.

Method PFC_IDA: The recovery for the labeled isotope(s) M2-6:2 FTS in the following sample: IA-IDW01-20231107 (670-29971-1) is outside the QC acceptance limits. The following action was taken: This sample was re-extracted within the required holding time and the recovery for labeled isotope(s) M2-6:2 FTS was within QC acceptance limits.

Method PFC_IDA: The recovery for a target analyte(s) Perfluoroheptanoic acid and Perfluoropentanesulfonic acid in the laboratory control spike sample associated with the following sample: IA-IDW01-20231107 (670-29971-1) is outside the QC acceptance limits. The following action was taken: This sample was re-extracted within the required holding time and the recovery for a target analyte(s) Perfluoroheptanoic acid and Perfluoropentanesulfonic acid in the laboratory control spike sample(s) is within the QC acceptance limits.

Method PFC_IDA: The recovery for the labeled isotope(s): 13C4 PFBA in the following sample: IA-IDW01-20231107 (670-29971-1) is outside the QC acceptance limits. The following action was taken: This sample was re-extracted within the required holding time and the recovery for labeled isotope(s): 13C4 PFBA is again outside QC acceptance limits.

Method PFC_IDA: The sample injection standard peak areas in the following sample: IA-IDW01-20231107 (670-29971-1) are outside of the QC limits for both the initial injection and the re-extraction. The values here are from the initial injection of the sample.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Client Sample ID: IA-IDW01-20231107

Lab Sample ID: 670-29971-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Vinyl chloride	2.0		1.0	0.71	ug/L			1	8260D	Total/NA
1-Methylnaphthalene	0.31		0.18	0.032	ug/L			1	8270E SIM	Total/NA
2-Methylnaphthalene	0.27		0.18	0.039	ug/L			1	8270E SIM	Total/NA
Naphthalene	0.36		0.18	0.027	ug/L			1	8270E SIM	Total/NA
6:2 Fluorotelomer sulfonic acid	0.0013	I	0.0019	0.00047	ug/L			1	537 IDA	Total/NA
Perfluorobutanesulfonic acid	0.0038		0.0019	0.00028	ug/L			1	537 IDA	Total/NA
Perfluorobutanoic acid	0.13		0.0019	0.00094	ug/L			1	537 IDA	Total/NA
Perfluoroheptanoic acid	0.0020	J3	0.0019	0.00028	ug/L			1	537 IDA	Total/NA
Perfluorohexanesulfonic acid	0.0059		0.0019	0.00019	ug/L			1	537 IDA	Total/NA
Perfluorohexanoic acid	0.0066		0.0019	0.00094	ug/L			1	537 IDA	Total/NA
Perfluorononanoic acid	0.00044	I	0.0019	0.00019	ug/L			1	537 IDA	Total/NA
Perfluorooctanesulfonamide	0.0012	I	0.0019	0.00028	ug/L			1	537 IDA	Total/NA
Perfluorooctanesulfonic acid	0.021		0.0019	0.00047	ug/L			1	537 IDA	Total/NA
Perfluorooctanoic acid	0.0042		0.0019	0.00028	ug/L			1	537 IDA	Total/NA
Perfluoropentanesulfonic acid	0.00059	I J3	0.0019	0.00028	ug/L			1	537 IDA	Total/NA
Perfluoropentanoic acid	0.018		0.0019	0.00028	ug/L			1	537 IDA	Total/NA

Client Sample ID: IA-TB-20231107

Lab Sample ID: 670-29971-2

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Client Sample ID: IA-IDW01-20231107

Lab Sample ID: 670-29971-1

Date Collected: 11/07/23 13:10

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/16/23 16:59	1
Vinyl chloride	2.0		1.0	0.71	ug/L			11/16/23 16:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		41 - 142					11/16/23 16:59	1
Toluene-d8 (Surr)	100		40 - 146					11/16/23 16:59	1
Dibromofluoromethane (Surr)	99		53 - 146					11/16/23 16:59	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.31		0.18	0.032	ug/L		11/09/23 10:14	11/10/23 16:45	1
2-Methylnaphthalene	0.27		0.18	0.039	ug/L		11/09/23 10:14	11/10/23 16:45	1
Naphthalene	0.36		0.18	0.027	ug/L		11/09/23 10:14	11/10/23 16:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	92		42 - 157				11/09/23 10:14	11/10/23 16:45	1
Fluoranthene-d10 (Surr)	99		37 - 152				11/09/23 10:14	11/10/23 16:45	1

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	200	U	400	200	ug/L			11/08/23 13:48	1

Method: EPA 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11CI-PF3OUdS	0.00047	U	0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
4:2 Fluorotelomer sulfonic acid	0.00047	U	0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
6:2 Fluorotelomer sulfonic acid	0.0013	I	0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
8:2 Fluorotelomer sulfonic acid	0.00056	U	0.0019	0.00056	ug/L		11/10/23 15:36	11/16/23 15:35	1
9CI-PF3ONS	0.00047	U	0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
DONA	0.00047	U	0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
HFPODA	0.00038	U	0.0019	0.00038	ug/L		11/10/23 15:36	11/16/23 15:35	1
NEtFOSAA	0.00047	U	0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
NMeFOSAA	0.00038	U	0.0019	0.00038	ug/L		11/10/23 15:36	11/16/23 15:35	1
NMeFOSA	0.00066	U	0.0019	0.00066	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorobutanesulfonic acid	0.0038		0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorobutanoic acid	0.13		0.0019	0.00094	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorodecanesulfonic acid	0.00028	U	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorodecanoic acid	0.00028	U	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorododecanoic acid	0.00038	U	0.0019	0.00038	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluoroheptanesulfonic acid	0.00028	U	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluoroheptanoic acid	0.0020	J3	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorohexanesulfonic acid	0.0059		0.0019	0.00019	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorohexanoic acid	0.0066		0.0019	0.00094	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorononanesulfonic acid	0.00028	U	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorononanoic acid	0.00044	I	0.0019	0.00019	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorooctanesulfonamide	0.0012	I	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorooctanesulfonic acid	0.021		0.0019	0.00047	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorooctanoic acid	0.0042		0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluoropentanesulfonic acid	0.00059	I J3	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluoropentanoic acid	0.018		0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluorotetradecanoic acid	0.00038	U	0.0019	0.00038	ug/L		11/10/23 15:36	11/16/23 15:35	1

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Client Sample ID: IA-IDW01-20231107

Lab Sample ID: 670-29971-1

Date Collected: 11/07/23 13:10

Matrix: Water

Date Received: 11/07/23 15:00

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid	0.00038	U	0.0019	0.00038	ug/L		11/10/23 15:36	11/16/23 15:35	1
Perfluoroundecanoic acid	0.00028	U	0.0019	0.00028	ug/L		11/10/23 15:36	11/16/23 15:35	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
M2-4:2 FTS	199		35 - 200				11/10/23 15:36	11/16/23 15:35	1
M2-6:2 FTS	244	*	40 - 200				11/10/23 15:36	11/16/23 15:35	1
M2-8:2 FTS	218	*	37 - 200				11/10/23 15:36	11/16/23 15:35	1
13C2 PFTeDA	72		10 - 171				11/10/23 15:36	11/16/23 15:35	1
13C3 HFPO-DA	48		13 - 170				11/10/23 15:36	11/16/23 15:35	1
13C3 PFBS	193		34 - 200				11/10/23 15:36	11/16/23 15:35	1
13C4 PFBA	4	*	22 - 174				11/10/23 15:36	11/16/23 15:35	1
13C4 PFHpA	87		40 - 165				11/10/23 15:36	11/16/23 15:35	1
13C5 PFPeA	58		33 - 196				11/10/23 15:36	11/16/23 15:35	1
13C8 PFOA	97		52 - 153				11/10/23 15:36	11/16/23 15:35	1
13C8 PFOS	100		59 - 155				11/10/23 15:36	11/16/23 15:35	1
d3-NMeFOSAA	99		38 - 168				11/10/23 15:36	11/16/23 15:35	1
d5-NEtFOSAA	119		34 - 181				11/10/23 15:36	11/16/23 15:35	1
13C3 PFHxS	95		48 - 169				11/10/23 15:36	11/16/23 15:35	1
13C5 PFHxA	52		28 - 166				11/10/23 15:36	11/16/23 15:35	1
13C6 PFDA	101		53 - 151				11/10/23 15:36	11/16/23 15:35	1
13C7 PFUnA	93		41 - 163				11/10/23 15:36	11/16/23 15:35	1
d3-NMePFOSA	32		10 - 130				11/10/23 15:36	11/16/23 15:35	1
13C8 FOSA	69		10 - 155				11/10/23 15:36	11/16/23 15:35	1
13C2-PFDoDA	91		22 - 165				11/10/23 15:36	11/16/23 15:35	1
13C9 PFNA	120		52 - 168				11/10/23 15:36	11/16/23 15:35	1

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Phosphorus as P (EPA 365.4)	400	U	1000	400	ug/L		11/08/23 09:23	11/08/23 15:59	10

Client Sample ID: IA-TB-20231107

Lab Sample ID: 670-29971-2

Date Collected: 11/07/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/16/23 16:41	1
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/16/23 16:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		41 - 142					11/16/23 16:41	1
Toluene-d8 (Surr)	100		40 - 146					11/16/23 16:41	1
Dibromofluoromethane (Surr)	100		53 - 146					11/16/23 16:41	1

Surrogate Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		BFB (41-142)	TOL (40-146)	DBFM (53-146)
670-29971-1	IA-IDW01-20231107	99	100	99
670-29971-2	IA-TB-20231107	99	100	100
670-30231-C-8 MS	Matrix Spike	96	102	103
670-30231-C-8 MSD	Matrix Spike Duplicate	98	101	102
LCS 670-63682/4	Lab Control Sample	98	101	100
MB 670-63682/7	Method Blank	100	100	101

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
 TOL = Toluene-d8 (Surr)
 DBFM = Dibromofluoromethane (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		2MN (42-157)	FLN10 (37-152)
670-29971-1	IA-IDW01-20231107	92	99
LCS 670-62517/2-A	Lab Control Sample	88	101
LCSD 670-62517/3-A	Lab Control Sample Dup	100	107
MB 670-62517/1-A	Method Blank	97	108

Surrogate Legend

2MN = 2-methylnaphthalene-d10
 FLN10 = Fluoranthene-d10 (Surr)

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 537 IDA - EPA 537 Isotope Dilution

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	M242FTS (35-200)	M262FTS (40-200)	M282FTS (37-200)	PFTDA (10-171)	HFPODA (13-170)	C3PFBS (34-200)	PFBA (22-174)	C4PFHA (40-165)
670-29971-1	IA-IDW01-20231107	199	244 *	218 *	72	48	193	4 *	87
LCS 410-442171/2-A	Lab Control Sample	102	103	95	109	94	119	103	117
LCSD 410-442171/3-A	Lab Control Sample Dup	123	113	112	122	105	136	98	133
MB 410-442171/1-A	Method Blank	93	81	81	89	84	103	84	106

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFPeA (33-196)	C8PFOA (52-153)	C8PFOS (59-155)	d3NMFOS (38-168)	d5NEFOS (34-181)	C3PFHS (48-169)	13C5PHA (28-166)	C6PFDA (53-151)
670-29971-1	IA-IDW01-20231107	58	97	100	99	119	95	52	101
LCS 410-442171/2-A	Lab Control Sample	112	104	100	103	112	110	107	106
LCSD 410-442171/3-A	Lab Control Sample Dup	120	114	119	118	124	121	119	121
MB 410-442171/1-A	Method Blank	96	88	87	84	90	97	97	89

		Percent Isotope Dilution Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	13C7PUA (41-163)	d3NMFSA (10-130)	PFOSA (10-155)	PFDODA (22-165)	C9PFNA (52-168)
670-29971-1	IA-IDW01-20231107	93	32	69	91	120
LCS 410-442171/2-A	Lab Control Sample	112	46	89	113	106
LCSD 410-442171/3-A	Lab Control Sample Dup	124	59	99	131	118
MB 410-442171/1-A	Method Blank	91	39	71	92	92

Surrogate Legend

- M242FTS = M2-4:2 FTS
- M262FTS = M2-6:2 FTS
- M282FTS = M2-8:2 FTS
- PFTDA = 13C2 PFTeDA
- HFPODA = 13C3 HFPO-DA
- C3PFBS = 13C3 PFBS
- PFBA = 13C4 PFBA
- C4PFHA = 13C4 PFHpA
- PFPeA = 13C5 PFPeA
- C8PFOA = 13C8 PFOA
- C8PFOS = 13C8 PFOS
- d3NMFOS = d3-NMeFOSAA
- d5NEFOS = d5-NEtFOSAA
- C3PFHS = 13C3 PFHxS
- 13C5PHA = 13C5 PFHxA
- C6PFDA = 13C6 PFDA
- 13C7PUA = 13C7 PFUnA
- d3NMFSA = d3-NMePFOSA
- PFOSA = 13C8 FOSA
- PFDODA = 13C2-PFDODA
- C9PFNA = 13C9 PFNA

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 670-63682/7

Matrix: Water

Analysis Batch: 63682

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB	MB	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Isopropylbenzene	0.67	U	2.0	0.67	ug/L			11/16/23 15:14	1
Vinyl chloride	0.71	U	1.0	0.71	ug/L			11/16/23 15:14	1
Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac			
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	100		41 - 142		11/16/23 15:14	1			
Toluene-d8 (Surr)	100		40 - 146		11/16/23 15:14	1			
Dibromofluoromethane (Surr)	101		53 - 146		11/16/23 15:14	1			

Lab Sample ID: LCS 670-63682/4

Matrix: Water

Analysis Batch: 63682

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Isopropylbenzene	20.0	18.1		ug/L		90	60 - 132
Vinyl chloride	20.0	17.8		ug/L		89	20 - 167
Surrogate	LCS	LCS	Limits				
	%Recovery	Qualifier					
4-Bromofluorobenzene (Surr)	98		41 - 142				
Toluene-d8 (Surr)	101		40 - 146				
Dibromofluoromethane (Surr)	100		53 - 146				

Lab Sample ID: 670-30231-C-8 MS

Matrix: Water

Analysis Batch: 63682

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec Limits
	Result	Qualifier		Result	Qualifier				
Isopropylbenzene	13	U	400	363		ug/L		91	60 - 132
Vinyl chloride	740		400	1100		ug/L		90	20 - 167
Surrogate	MS	MS	Limits						
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	96		41 - 142						
Toluene-d8 (Surr)	102		40 - 146						
Dibromofluoromethane (Surr)	103		53 - 146						

Lab Sample ID: 670-30231-C-8 MSD

Matrix: Water

Analysis Batch: 63682

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample	Sample	Spike Added	MSD	MSD	Unit	D	%Rec	%Rec Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Isopropylbenzene	13	U	400	411		ug/L		103	60 - 132	12	23
Vinyl chloride	740		400	1110		ug/L		92	20 - 167	1	24
Surrogate	MSD	MSD	Limits								
	%Recovery	Qualifier									
4-Bromofluorobenzene (Surr)	98		41 - 142								
Toluene-d8 (Surr)	101		40 - 146								
Dibromofluoromethane (Surr)	102		53 - 146								

QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 670-62517/1-A
Matrix: Water
Analysis Batch: 62710

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 62517

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1-Methylnaphthalene	0.032	U	0.18	0.032	ug/L		11/09/23 10:14	11/10/23 11:25	1
2-Methylnaphthalene	0.039	U	0.18	0.039	ug/L		11/09/23 10:14	11/10/23 11:25	1
Naphthalene	0.027	U	0.18	0.027	ug/L		11/09/23 10:14	11/10/23 11:25	1
Surrogate		MB MB	Limits			Prepared	Analyzed	Dil Fac	
		%Recovery		Qualifier					
2-methylnaphthalene-d10		97	42 - 157			11/09/23 10:14	11/10/23 11:25	1	
Fluoranthene-d10 (Surr)		108	37 - 152			11/09/23 10:14	11/10/23 11:25	1	

Lab Sample ID: LCS 670-62517/2-A
Matrix: Water
Analysis Batch: 62710

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 62517

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
1-Methylnaphthalene	3.64	3.12		ug/L		86	45 - 148
2-Methylnaphthalene	3.64	2.82		ug/L		78	41 - 146
Naphthalene	3.64	1.88		ug/L		52	44 - 166
Surrogate		LCS LCS	Limits			%Recovery	Qualifier
		%Recovery					
2-methylnaphthalene-d10		88	42 - 157				
Fluoranthene-d10 (Surr)		101	37 - 152				

Lab Sample ID: LCSD 670-62517/3-A
Matrix: Water
Analysis Batch: 62710

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 62517

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	
		Result	Qualifier					RPD	Limit
1-Methylnaphthalene	3.64	2.72		ug/L		75	45 - 148	14	25
2-Methylnaphthalene	3.64	2.48		ug/L		68	41 - 146	13	25
Naphthalene	3.64	1.75		ug/L		48	44 - 166	7	25
Surrogate		LCSD LCSD	Limits			%Recovery	Qualifier		
		%Recovery							
2-methylnaphthalene-d10		100	42 - 157						
Fluoranthene-d10 (Surr)		107	37 - 152						

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 670-62259/6
Matrix: Water
Analysis Batch: 62259

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Nitrate as N	200	U	400	200	ug/L			11/08/23 10:24	1

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 670-62259/4

Matrix: Water

Analysis Batch: 62259

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	4000	3790		ug/L		95	90 - 110

Lab Sample ID: LCSD 670-62259/5

Matrix: Water

Analysis Batch: 62259

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N	4000	3700		ug/L		93	90 - 110	2	20

Lab Sample ID: 660-132795-D-1 MS

Matrix: Water

Analysis Batch: 62259

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	200	U	5000	4710		ug/L		94	80 - 120

Lab Sample ID: 660-132795-D-1 MSD

Matrix: Water

Analysis Batch: 62259

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N	200	U	5000	4680		ug/L		94	80 - 120	1	20

Method: 537 IDA - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-442171/1-A

Matrix: Water

Analysis Batch: 444170

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 442171

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11CI-PF3OUdS	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
4:2 Fluorotelomer sulfonic acid	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
6:2 Fluorotelomer sulfonic acid	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
8:2 Fluorotelomer sulfonic acid	0.00060	U	0.0020	0.00060	ug/L		11/10/23 15:36	11/16/23 10:58	1
9CI-PF3ONS	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
DONA	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
HFPODA	0.00040	U	0.0020	0.00040	ug/L		11/10/23 15:36	11/16/23 10:58	1
NEtFOSAA	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
NMeFOSAA	0.00040	U	0.0020	0.00040	ug/L		11/10/23 15:36	11/16/23 10:58	1
NMeFOSA	0.00070	U	0.0020	0.00070	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorobutanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorobutanoic acid	0.0010	U	0.0020	0.0010	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorodecanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorodecanoic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorododecanoic acid	0.00040	U	0.0020	0.00040	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluoroheptanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluoroheptanoic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorohexanesulfonic acid	0.00020	U	0.0020	0.00020	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorohexanoic acid	0.0010	U	0.0020	0.0010	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorononanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-442171/1-A
Matrix: Water
Analysis Batch: 444170

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 442171

Analyte	MB	MB	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorononanoic acid	0.00020	U	0.0020	0.00020	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorooctanesulfonamide	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorooctanesulfonic acid	0.00050	U	0.0020	0.00050	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorooctanoic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluoropentanesulfonic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluoropentanoic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorotetradecanoic acid	0.00040	U	0.0020	0.00040	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluorotridecanoic acid	0.00040	U	0.0020	0.00040	ug/L		11/10/23 15:36	11/16/23 10:58	1
Perfluoroundecanoic acid	0.00030	U	0.0020	0.00030	ug/L		11/10/23 15:36	11/16/23 10:58	1

Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
M2-4:2 FTS	93		35 - 200	11/10/23 15:36	11/16/23 10:58	1
M2-6:2 FTS	81		40 - 200	11/10/23 15:36	11/16/23 10:58	1
M2-8:2 FTS	81		37 - 200	11/10/23 15:36	11/16/23 10:58	1
13C2 PFTeDA	89		10 - 171	11/10/23 15:36	11/16/23 10:58	1
13C3 HFPO-DA	84		13 - 170	11/10/23 15:36	11/16/23 10:58	1
13C3 PFBS	103		34 - 200	11/10/23 15:36	11/16/23 10:58	1
13C4 PFBA	84		22 - 174	11/10/23 15:36	11/16/23 10:58	1
13C4 PFHpA	106		40 - 165	11/10/23 15:36	11/16/23 10:58	1
13C5 PFPeA	96		33 - 196	11/10/23 15:36	11/16/23 10:58	1
13C8 PFOA	88		52 - 153	11/10/23 15:36	11/16/23 10:58	1
13C8 PFOS	87		59 - 155	11/10/23 15:36	11/16/23 10:58	1
d3-NMeFOSAA	84		38 - 168	11/10/23 15:36	11/16/23 10:58	1
d5-NEtFOSAA	90		34 - 181	11/10/23 15:36	11/16/23 10:58	1
13C3 PFHxS	97		48 - 169	11/10/23 15:36	11/16/23 10:58	1
13C5 PFHxA	97		28 - 166	11/10/23 15:36	11/16/23 10:58	1
13C6 PFDA	89		53 - 151	11/10/23 15:36	11/16/23 10:58	1
13C7 PFUnA	91		41 - 163	11/10/23 15:36	11/16/23 10:58	1
d3-NMePFOSA	39		10 - 130	11/10/23 15:36	11/16/23 10:58	1
13C8 FOSA	71		10 - 155	11/10/23 15:36	11/16/23 10:58	1
13C2-PFDODA	92		22 - 165	11/10/23 15:36	11/16/23 10:58	1
13C9 PFNA	92		52 - 168	11/10/23 15:36	11/16/23 10:58	1

Lab Sample ID: LCS 410-442171/2-A
Matrix: Water
Analysis Batch: 444170

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 442171

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
11Cl-PF3OUdS	0.0238	0.0167		ug/L		70	57 - 130
4:2 Fluorotelomer sulfonic acid	0.0239	0.0168		ug/L		70	61 - 131
6:2 Fluorotelomer sulfonic acid	0.0243	0.0163		ug/L		67	61 - 132
8:2 Fluorotelomer sulfonic acid	0.0245	0.0173		ug/L		71	55 - 134
9Cl-PF3ONS	0.0238	0.0168		ug/L		70	60 - 130
DONA	0.0242	0.0149		ug/L		61	61 - 130
HFPODA	0.0256	0.0187		ug/L		73	53 - 131
NEtFOSAA	0.0256	0.0165		ug/L		64	63 - 130
NMeFOSAA	0.0256	0.0172		ug/L		67	62 - 131
NMeFOSA	0.0256	0.0194		ug/L		76	53 - 167
Perfluorobutanesulfonic acid	0.0227	0.0147		ug/L		65	64 - 132

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-442171/2-A

Matrix: Water

Analysis Batch: 444170

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 442171

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Perfluorobutanoic acid	0.0256	0.0168		ug/L		66	58 - 130
Perfluorodecanesulfonic acid	0.0247	0.0167		ug/L		68	55 - 130
Perfluorodecanoic acid	0.0256	0.0177		ug/L		69	62 - 133
Perfluorododecanoic acid	0.0256	0.0168		ug/L		66	61 - 132
Perfluoroheptanesulfonic acid	0.0244	0.0151		ug/L		62	59 - 130
Perfluoroheptanoic acid	0.0256	0.0158	J3	ug/L		62	64 - 130
Perfluorohexanesulfonic acid	0.0233	0.0152		ug/L		65	62 - 130
Perfluorohexanoic acid	0.0256	0.0161		ug/L		63	59 - 130
Perfluorononanesulfonic acid	0.0246	0.0176		ug/L		72	56 - 130
Perfluorononanoic acid	0.0256	0.0169		ug/L		66	63 - 133
Perfluorooctanesulfonamide	0.0256	0.0198		ug/L		78	67 - 132
Perfluorooctanesulfonic acid	0.0237	0.0156		ug/L		66	62 - 130
Perfluorooctanoic acid	0.0256	0.0175		ug/L		68	58 - 132
Perfluoropentanesulfonic acid	0.0240	0.0150	J3	ug/L		62	64 - 132
Perfluoropentanoic acid	0.0256	0.0163		ug/L		64	60 - 130
Perfluorotetradecanoic acid	0.0256	0.0170		ug/L		66	62 - 131
Perfluorotridecanoic acid	0.0256	0.0171		ug/L		67	59 - 136
Perfluoroundecanoic acid	0.0256	0.0173		ug/L		68	62 - 131

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	102		35 - 200
M2-6:2 FTS	103		40 - 200
M2-8:2 FTS	95		37 - 200
13C2 PFTeDA	109		10 - 171
13C3 HFPO-DA	94		13 - 170
13C3 PFBS	119		34 - 200
13C4 PFBA	103		22 - 174
13C4 PFHpA	117		40 - 165
13C5 PFPeA	112		33 - 196
13C8 PFOA	104		52 - 153
13C8 PFOS	100		59 - 155
d3-NMeFOSAA	103		38 - 168
d5-NEtFOSAA	112		34 - 181
13C3 PFHxS	110		48 - 169
13C5 PFHxA	107		28 - 166
13C6 PFDA	106		53 - 151
13C7 PFUnA	112		41 - 163
d3-NMePFOSA	46		10 - 130
13C8 FOSA	89		10 - 155
13C2-PFDoDA	113		22 - 165
13C9 PFNA	106		52 - 168

Lab Sample ID: LCS 410-442171/3-A

Matrix: Water

Analysis Batch: 444170

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 442171

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits	RPD	
		Result	Qualifier					RPD	Limit
11Cl-PF3OUdS	0.0238	0.0163		ug/L		68	57 - 130	3	30
4:2 Fluorotelomer sulfonic acid	0.0239	0.0160		ug/L		67	61 - 131	5	30

Eurofins Orlando

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-442171/3-A

Matrix: Water

Analysis Batch: 444170

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 442171

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
6:2 Fluorotelomer sulfonic acid	0.0243	0.0170		ug/L		70	61 - 132	4	30
8:2 Fluorotelomer sulfonic acid	0.0245	0.0168		ug/L		69	55 - 134	3	30
9CI-PF3ONS	0.0238	0.0157		ug/L		66	60 - 130	6	30
DONA	0.0242	0.0149		ug/L		61	61 - 130	0	30
HFPODA	0.0256	0.0187		ug/L		73	53 - 131	0	30
NEtFOSAA	0.0256	0.0174		ug/L		68	63 - 130	6	30
NMeFOSAA	0.0256	0.0179		ug/L		70	62 - 131	4	30
NMeFOSA	0.0256	0.0201		ug/L		79	53 - 167	4	30
Perfluorobutanesulfonic acid	0.0227	0.0149		ug/L		66	64 - 132	1	30
Perfluorobutanoic acid	0.0256	0.0171		ug/L		67	58 - 130	2	30
Perfluorodecanesulfonic acid	0.0247	0.0161		ug/L		65	55 - 130	4	30
Perfluorodecanoic acid	0.0256	0.0183		ug/L		72	62 - 133	3	30
Perfluorododecanoic acid	0.0256	0.0174		ug/L		68	61 - 132	4	30
Perfluoroheptanesulfonic acid	0.0244	0.0156		ug/L		64	59 - 130	3	30
Perfluoroheptanoic acid	0.0256	0.0160	J3	ug/L		62	64 - 130	1	30
Perfluorohexanesulfonic acid	0.0233	0.0159		ug/L		68	62 - 130	4	30
Perfluorohexanoic acid	0.0256	0.0172		ug/L		67	59 - 130	7	30
Perfluorononanesulfonic acid	0.0246	0.0168		ug/L		69	56 - 130	5	30
Perfluorononanoic acid	0.0256	0.0172		ug/L		67	63 - 133	1	30
Perfluorooctanesulfonamide	0.0256	0.0205		ug/L		80	67 - 132	3	30
Perfluorooctanesulfonic acid	0.0237	0.0149		ug/L		63	62 - 130	5	30
Perfluorooctanoic acid	0.0256	0.0182		ug/L		71	58 - 132	4	30
Perfluoropentanesulfonic acid	0.0240	0.0161		ug/L		67	64 - 132	8	30
Perfluoropentanoic acid	0.0256	0.0168		ug/L		66	60 - 130	3	30
Perfluorotetradecanoic acid	0.0256	0.0173		ug/L		67	62 - 131	2	30
Perfluorotridecanoic acid	0.0256	0.0181		ug/L		71	59 - 136	6	30
Perfluoroundecanoic acid	0.0256	0.0177		ug/L		69	62 - 131	2	30

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
M2-4:2 FTS	123		35 - 200
M2-6:2 FTS	113		40 - 200
M2-8:2 FTS	112		37 - 200
13C2 PFTeDA	122		10 - 171
13C3 HFPO-DA	105		13 - 170
13C3 PFBS	136		34 - 200
13C4 PFBA	98		22 - 174
13C4 PFHpA	133		40 - 165
13C5 PFPeA	120		33 - 196
13C8 PFOA	114		52 - 153
13C8 PFOS	119		59 - 155
d3-NMeFOSAA	118		38 - 168
d5-NEtFOSAA	124		34 - 181
13C3 PFHxS	121		48 - 169
13C5 PFHxA	119		28 - 166
13C6 PFDA	121		53 - 151
13C7 PFUnA	124		41 - 163
d3-NMePFOSA	59		10 - 130
13C8 FOSA	99		10 - 155
13C2-PFDODA	131		22 - 165

Eurofins Orlando

QC Sample Results

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-442171/3-A
 Matrix: Water
 Analysis Batch: 444170

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA
 Prep Batch: 442171

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C9 PFNA	118		52 - 168

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 670-62270/2-A
 Matrix: Water
 Analysis Batch: 62369

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 62270

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Phosphorus as P	40	U	100	40	ug/L		11/08/23 09:23	11/08/23 15:33	1

Lab Sample ID: LCS 670-62270/1-A
 Matrix: Water
 Analysis Batch: 62369

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 62270

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Phosphorus as P	1500	1440		ug/L		96	90 - 110

Lab Sample ID: 670-29941-B-3-A MS
 Matrix: Water
 Analysis Batch: 62369

Client Sample ID: Matrix Spike
 Prep Type: Total/NA
 Prep Batch: 62270

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Phosphorus as P	380	J3	1500	40	U J3	ug/L		0	85 - 115

Lab Sample ID: 670-29941-B-3-B MSD
 Matrix: Water
 Analysis Batch: 62369

Client Sample ID: Matrix Spike Duplicate
 Prep Type: Total/NA
 Prep Batch: 62270

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Phosphorus as P	380	J3	1500	40	U J3	ug/L		0	85 - 115	NC	20

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

GC/MS VOA

Analysis Batch: 63682

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	8260D	
670-29971-2	IA-TB-20231107	Total/NA	Water	8260D	
MB 670-63682/7	Method Blank	Total/NA	Water	8260D	
LCS 670-63682/4	Lab Control Sample	Total/NA	Water	8260D	
670-30231-C-8 MS	Matrix Spike	Total/NA	Water	8260D	
670-30231-C-8 MSD	Matrix Spike Duplicate	Total/NA	Water	8260D	

GC/MS Semi VOA

Prep Batch: 62517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	3511	
MB 670-62517/1-A	Method Blank	Total/NA	Water	3511	
LCS 670-62517/2-A	Lab Control Sample	Total/NA	Water	3511	
LCSD 670-62517/3-A	Lab Control Sample Dup	Total/NA	Water	3511	

Analysis Batch: 62710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	8270E SIM	62517
MB 670-62517/1-A	Method Blank	Total/NA	Water	8270E SIM	62517
LCS 670-62517/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	62517
LCSD 670-62517/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	62517

HPLC/IC

Analysis Batch: 62259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	300.0	
MB 670-62259/6	Method Blank	Total/NA	Water	300.0	
LCS 670-62259/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 670-62259/5	Lab Control Sample Dup	Total/NA	Water	300.0	
660-132795-D-1 MS	Matrix Spike	Total/NA	Water	300.0	
660-132795-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

LCMS

Prep Batch: 442171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	SPE	
MB 410-442171/1-A	Method Blank	Total/NA	Water	SPE	
LCS 410-442171/2-A	Lab Control Sample	Total/NA	Water	SPE	
LCSD 410-442171/3-A	Lab Control Sample Dup	Total/NA	Water	SPE	

Analysis Batch: 444170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	537 IDA	442171
MB 410-442171/1-A	Method Blank	Total/NA	Water	537 IDA	442171
LCS 410-442171/2-A	Lab Control Sample	Total/NA	Water	537 IDA	442171
LCSD 410-442171/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	442171

QC Association Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

LCMS

Prep Batch: 444942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1 - RE	IA-IDW01-20231107	Total/NA	Water	SPE	
MB 410-444942/1-A	Method Blank	Total/NA	Water	SPE	
LCS 410-444942/2-A	Lab Control Sample	Total/NA	Water	SPE	
LCSD 410-444942/3-A	Lab Control Sample Dup	Total/NA	Water	SPE	

Analysis Batch: 446449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1 - RE	IA-IDW01-20231107	Total/NA	Water	537 IDA	444942
MB 410-444942/1-A	Method Blank	Total/NA	Water	537 IDA	444942
LCS 410-444942/2-A	Lab Control Sample	Total/NA	Water	537 IDA	444942
LCSD 410-444942/3-A	Lab Control Sample Dup	Total/NA	Water	537 IDA	444942

General Chemistry

Prep Batch: 62270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	365.2/365.3/365	
MB 670-62270/2-A	Method Blank	Total/NA	Water	365.2/365.3/365	
LCS 670-62270/1-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
670-29941-B-3-A MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
670-29941-B-3-B MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 62369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-29971-1	IA-IDW01-20231107	Total/NA	Water	365.4	62270
MB 670-62270/2-A	Method Blank	Total/NA	Water	365.4	62270
LCS 670-62270/1-A	Lab Control Sample	Total/NA	Water	365.4	62270
670-29941-B-3-A MS	Matrix Spike	Total/NA	Water	365.4	62270
670-29941-B-3-B MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	62270

Lab Chronicle

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Client Sample ID: IA-IDW01-20231107

Lab Sample ID: 670-29971-1

Date Collected: 11/07/23 13:10

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63682	KG	EET ORL	11/16/23 16:59
Total/NA	Prep	3511			62517	SI	EET ORL	11/09/23 10:14
Total/NA	Analysis	8270E SIM		1	62710	JI	EET ORL	11/10/23 16:45
Total/NA	Analysis	300.0		1	62259	YS	EET ORL	11/08/23 13:48
Total/NA	Prep	SPE	RE		444942	HAT6	ELLE	11/17/23 16:23
Total/NA	Analysis	537 IDA	RE	1	446449	DQV6	ELLE	11/22/23 20:32
Total/NA	Prep	SPE			442171	HAT6	ELLE	11/10/23 15:36
Total/NA	Analysis	537 IDA		1	444170	DS2G	ELLE	11/16/23 15:35
Total/NA	Prep	365.2/365.3/365			62270	JA	EET ORL	11/08/23 09:23
Total/NA	Analysis	365.4		10	62369	JA	EET ORL	11/08/23 15:59

Client Sample ID: IA-TB-20231107

Lab Sample ID: 670-29971-2

Date Collected: 11/07/23 08:00

Matrix: Water

Date Received: 11/07/23 15:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	63682	KG	EET ORL	11/16/23 16:41

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87997	06-30-24

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Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET ORL
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	EET ORL
300.0	Anions, Ion Chromatography	EPA	EET ORL
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE
365.4	Phosphorus, Total	EPA	EET ORL
3511	Microextraction of Organic Compounds	SW846	EET ORL
365.2/365.3/365	Phosphorus, Total	EPA	EET ORL
5030C	Purge and Trap	SW846	EET ORL
SPE	PFAS by SPE	Lab SOP	ELLE

Protocol References:

EPA = US Environmental Protection Agency

Lab SOP = Laboratory Standard Operating Procedure

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Industrial Area IDW

Job ID: 670-29971-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-29971-1	IA-IDW01-20231107	Water	11/07/23 13:10	11/07/23 15:00
670-29971-2	IA-TB-20231107	Water	11/07/23 08:00	11/07/23 15:00

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Eurofins Orlando

481 Newburyport Avenue
 Allamonte Springs, FL 32701
 Phone: 407-339-5984 Fax: 407-260-6110

Chain of Custody Record



eurofins

Client Information (Sub Contract Lab)		Sampler:		Lab PM: Dylnicki, Kaitlin		Carrier Tracking No(s):		COC No: 670-18409.1			
Client Contact: Shipping/Receiving		Phone:		E-Mail: kaitlin.dylnicki@et.eurofinsus.com		State of Origin: Florida		Page: Page 1 of 1			
Company: Eurofins Lancaster Laboratories Environm				Accreditations Required (See note): NELAP - Florida				Job #: 670-29971-1			
Address: 2425 New Holland Pike, City: Lancaster State, Zip: PA, 17601 Phone: 717-656-2300(Tel) Email:		Due Date Requested: 11/17/2023 TAT Requested (days):		Analysis Requested				Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Y - Trizma Z - other (specify) Other:			
Project Name: NASA KSC Industrial Area IDW Site:		PO #: WO #: Project #: 67001282 SSOW#:									
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/soil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_ID/APFAS_W_Prep (MOD) NASA KCS WS#15-2	PRE_SCREEN_PFAS/PFAS_PreScn_W_P	Total Number of containers	Special Instructions/Note:
IA-IDW01-20231107 (670-29971-1)		11/7/23	13:10 Eastern		Water	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	X	2	
Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing Southeast, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Southeast, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Southeast, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Southeast, LLC.											
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
Unconfirmed						<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)				Primary Deliverable Rank: 2		Special Instructions/QC Requirements:					
Empty Kit Relinquished by:			Date:		Time:		Method of Shipment:				
Relinquished by: <i>del</i>			Date/Time: 11-8-23 1700		Company: E-ORL		Received by:		Date/Time:		Company:
Relinquished by:			Date/Time:		Company:		Received by:		Date/Time:		Company:
Relinquished by:			Date/Time:		Company:		Received by: <i>Jm</i>		Date/Time: 11/9/23 9:40		Company: <i>Orla</i>
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks: <i>2-2.1 C: 2-2</i>					

HWA

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Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-29971-1

Login Number: 29971

List Number: 1

Creator: Lavardera, Angelina

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-29971-1

Login Number: 29971

List Number: 2

Creator: Arroyo, Haley

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Creation: 11/09/23 11:45 AM

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	



APPENDIX F
IDW INVENTORY LOGS

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Site	Generation Date	Media	Source	Contact	IDW Origination	Location of Drums/Tanks	Tie Down Strap Yes/No	Pallet ID	Drum/Tank ID Number	pH	Concentrations (µg/L)
KP1	05/26/23	Liquid	MW0022	Greg Kusel (772) 631-7426	Groundwater sampling (purge and decon water)	CCF	Yes	Pallet 229674	Drum 229814 10% Full	6.58	Lab Report: J20417 and J20417-2 VC = 0.93 I Lead = 1.1 U N = 20 U P = 680 6:2 FTSA = 0.0022 PFBS = 0.0026 PFBA = 0.0074 PFDS = 0.00035 I PFHpS = 0.00031 I PFHpA = 0.0051 PFHxS = 0.0083 PFHxA = 0.0046 PFNA = 0.00036 I PFOS = 0.0081 J PFOA = 0.029 PFPeS = 0.0013 I PFPeA = 0.0058
LETf	05/26/23	Liquid	MW0001 and PSB-MW0001I								

IA LTM IDW Notes:

KP1 = KARS Park 1

LETf = Launch Equipment Test Facility

µg/L = micrograms per liter

U = the analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit

I = the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

J = estimated value

Bold indicates exceedance of FDEP GCTL or EPA RSL

VC = vinyl chloride

N = nitrate

P = total phosphorus

6:2 FTSA = 6:2 Fluorotelomer sulfonic acid

PFBS = perfluorobutanesulfonic acid

PFBA = perfluorobutanoic acid

PFDS = perfluorodecanesulfonic acid

PFHpS = perfluoroheptanesulfonic acid

PFHpA = perfluoroheptanoic acid

PFHxS = perfluorohexanesulfonic acid

PFHxA = perfluorohexanoic acid

PFNA = perfluorononanoic acid

PFOS = perfluorooctanesulfonic acid

PFOA = perfluorooctanoic acid

PFPeS = perfluoropentanesulfonic acid

PFPeA = perfluoropentanoic acid

Site	Generation Date	Media	Source	Contact	IDW Origination	Location of Drums/Tanks	Tie Down Strap Yes/No	Pallet ID	Drum/Tank ID Number	pH	Concentrations (µg/L)
GSSP	11/06/23	Liquid	MW0013, MW0019, MW0020, MW0024R, MW0034, MW0035, MW0036, MW0044R, MW0053, MW0059, MW0060, MW0061, MW0062, and MW0063	Greg Kusel (772) 631-7426	Groundwater sampling (purge and decon water)	CCF	Yes	Pallet 220341	Drum 228469 60% Full	7.46	Lab Report: J29971-1 VC = 2.0 IsoPB = 0.67 U Naph = 0.36 1-M = 0.31 2-M = 0.27 N = 200 U P = 400 U PFOS = 0.021 PFOA = 0.0042 PFOS+PFOA = 0.0252 PFNA = 0.00044 I PFBS = 0.0038 PFBA = 0.13 PFHxA = 0.0066 PFHxS = 0.0059 HFPO-DA = 0.00038 U PFHpA = 0.0020 J3 PFOSA = 0.0012 I PFPeS = 0.00059 I J3 PFPeA = 0.018 6:2-FTS = 0.0013 I
FSA1	11/07/23	Liquid	MW0001, MW0002, MW0012R, MW0014, MW0017A, MW0021, MW0022R, MW0023, MW0027, and MW0028								

IA LTM IDW Notes:

GSSP = General Services Administration Seized Property

FSA1 = Fuel Storage Area #1 Underground Storage Tank

µg/L = micrograms per liter

U = the analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit

I = the reported value is between the laboratory method detection limit and the laboratory practical quantitation limit

J3 = estimated value. Spike recovery or RPD outside of criteria

Bold indicates exceedance of FDEP GCTL or EPA RSL

VC = vinyl chloride

IsoPB = isopropylbenzene

Naph = naphthalene

1-M = 1-methylnaphthalene

2-M = 2-methylnaphthalene

N = nitrate

P = total phosphorus

PFOS = perfluorooctanesulfonic acid

PFOA = perfluorooctanoic acid

PFNA = perfluorononanoic acid

PFBS = perfluorobutanesulfonic acid

PFBA = perfluorobutanoic acid

PFHxA = perfluorohexanoic acid

PFHxS = perfluorohexanesulfonic acid

HFPO-DA = Hexafluoropropylene oxide dimer acid (GenX)

PFHpA = perfluoroheptanoic acid

PFOSA = perfluorooctanesulfonamide

PFPeS = perfluoropentanesulfonic acid

PFPeA = perfluoropentanoic acid

6:2-FTS = 6:2 fluorotelomer sulfonic acid

APPENDIX G

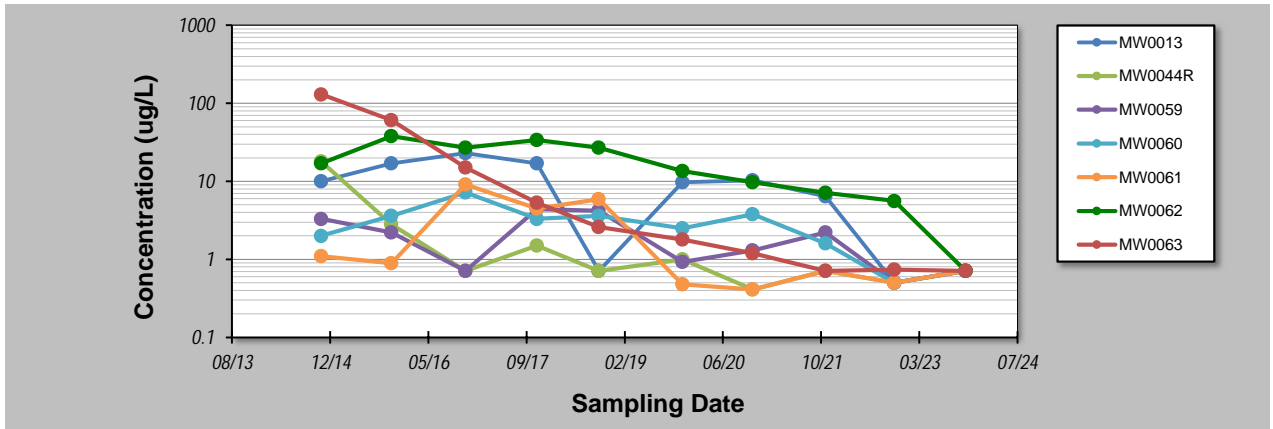
MANN-KENDALL ANALYSES

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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 28-Feb-24	Job ID: GSSP Source Area
Facility Name: NASA KSC IA LTM	Constituent: Vinyl Chloride
Conducted By: Greg Kusel	Concentration Units: ug/L

Sampling Point ID:	MW0013	MW0044R	MW0059	MW0060	MW0061	MW0062	MW0063	
Sampling Event	Sampling Date							
	VINYL CHLORIDE CONCENTRATION (ug/L)							
1	11-Nov-14	10	18	3.3	2	1.1	17	130
2	4-Nov-15	17	2.8	2.2	3.6	0.89	38	61
3	15-Nov-16	23	0.71	0.71	7.2	9.1	27	15
4	13-Nov-17	17	1.5	4.4	3.3	4.5	34	5.3
5	25-Sep-18	0.71	0.71	4.2	3.6	5.9	27	2.6
6	25-Nov-19	9.7	1	0.93	2.5	0.48	13.6	1.8
7	17-Nov-20	10.3	0.41	1.3	3.8	0.41	9.7	1.2
8	22-Nov-21	6.4	0.71	2.2	1.6	0.71	7.1	0.71
9	8-Nov-22	0.5	0.5	0.5	0.5	0.5	5.6	0.74
10	6-Nov-23	0.71	0.71	0.71	0.71	0.71	0.71	0.71
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:	0.81	2.00	0.72	0.67	1.25	0.71	1.93	
Mann-Kendall Statistic (S):	-23	-25	-17	-18	-16	-34	-42	
Confidence Factor:	97.7%	98.6%	92.2%	93.4%	90.7%	100.0%	>99.9%	
Concentration Trend:	Decreasing	Decreasing	Prob. Decreasing	Prob. Decreasing	Prob. Decreasing	Decreasing	Decreasing	



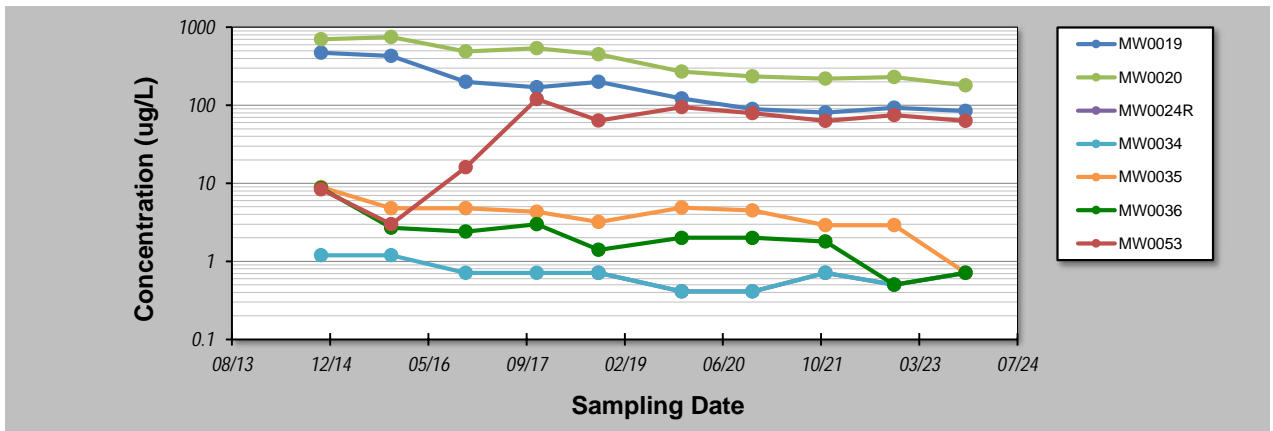
- Notes:**
- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
 - Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
 - Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 28-Feb-24	Job ID: GSSP Downgradient
Facility Name: NASA KSC IA LTM	Constituent: Vinyl Chloride
Conducted By: Greg Kusel	Concentration Units: ug/L

Sampling Point ID:	MW0019	MW0020	MW0024R	MW0034	MW0035	MW0036	MW0053
Sampling Event	VINYL CHLORIDE CONCENTRATION (ug/L)						
Sampling Date							
1	11-Nov-14	470	700	1.2	8.9	8.7	8.4
2	3-Nov-15	430	750	1.2	4.8	2.7	3
3	17-Nov-16	200	490	0.71	4.8	2.4	16
4	13-Nov-17	170	540	0.71	4.3	3	120
5	25-Sep-18	200	450	0.71	3.2	1.4	64
6	22-Nov-19	122	271	0.41	4.9	2	94.7
7	17-Nov-20	89.4	235	0.41	4.5	2	79.1
8	22-Nov-21	81	220	0.71	2.9	1.8	63
9	8-Nov-22	93	230	0.5	2.9	0.5	75
10	6-Nov-23	85	180	0.71	0.71	0.71	63
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
Coefficient of Variation:	0.74	0.52	0.26	0.38	0.50	0.92	0.65
Mann-Kendall Statistic (S):	-36	-39	3	-19	-31	-32	10
Confidence Factor:	>99.9%	>99.9%	64.0%	94.6%	99.8%	99.9%	78.4%
Concentration Trend:	Decreasing	Decreasing	No Trend	Prob. Decreasing	Decreasing	Decreasing	No Trend



- Notes:**
- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
 - Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
 - Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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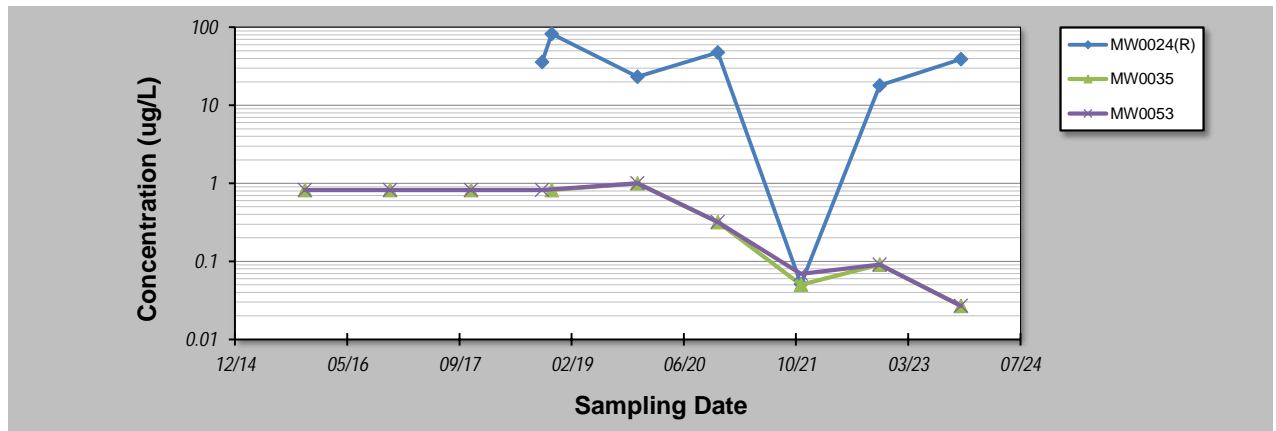
GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: 28-Feb-24	Job ID: GSSP
Facility Name: NASA KSC IA LTM	Constituent: Naphthalene
Conducted By: Greg Kusel	Concentration Units: ug/L

Sampling Point ID: **MW0024(R)** **MW0035** **MW0053**

Sampling Event	Sampling Date	NAPHTHALENE CONCENTRATION (ug/L)					
		MW0024(R)	MW0035	MW0053			
1	4-Nov-15		0.82	0.82			
2	17-Nov-16		0.82	0.82			
3	13-Nov-17		0.82	0.82			
4	25-Sep-18	36		0.82			
5	7-Nov-18	82	0.82				
6	25-Nov-19	23.2	1	1			
7	17-Nov-20	47.6	0.32	0.32			
8	22-Nov-21	0.051	0.05	0.069			
9	8-Nov-22	18	0.091	0.091			
10	6-Nov-23	39	0.027	0.027			
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20							

Coefficient of Variation:	0.74	0.75	0.75			
Mann-Kendall Statistic (S):	-5	-20	-20			
Confidence Factor:	71.9%	97.8%	97.8%			
Concentration Trend:	Stable	Decreasing	Decreasing			



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

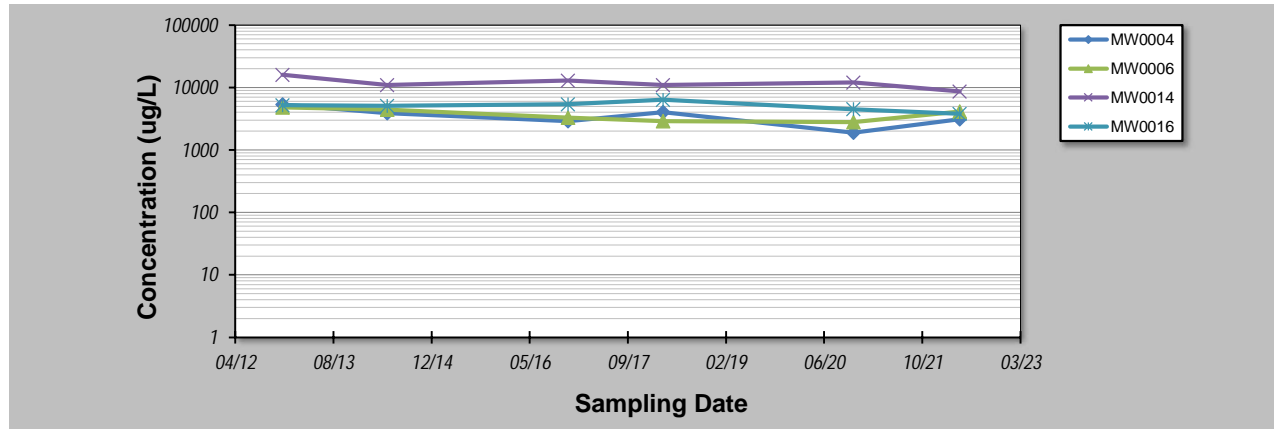
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GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date: **1-Mar-24** Job ID: **SSPF**
 Facility Name: **NASA KSC IA LTM** Constituent: **Total Ammonia**
 Conducted By: **Greg Kusel** Concentration Units: **ug/L**

Sampling Point ID: **MW0004** **MW0006** **MW0014** **MW0016**

Sampling Event	Sampling Date	TOTAL AMMONIA CONCENTRATION (ug/L)							
		MW0004	MW0006	MW0014	MW0016				
1	28-Nov-12	5360	4780	16000	5240				
2	15-May-14	3900	4400	11000	5100				
3	21-Nov-16	2900	3300	13000	5400				
4	21-Mar-18	4000	2900	11000	6400				
5	13-Nov-20	1900	2800	12000	4500				
6	10-May-22	3100	4100	8700	3800				
7									
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20									
Coefficient of Variation:		0.33	0.22	0.20	0.17				
Mann-Kendall Statistic (S):		-7	-9	-8	-5				
Confidence Factor:		86.4%	93.2%	89.8%	76.5%				
Concentration Trend:		Stable	Prob. Decreasing	Stable	Stable				



- Notes:**
- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
 - Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
 - Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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