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October 31, 2024
Project No. M0615.20.014

Steeve Teel, LHG, Cleanup Project Manager/Hydrogeologist
Washington State Department of Ecology
Toxics Cleanup Program, Southwest
P.O. Box 47775
Olympia, WA 98504

Re: Hylebos Marsh: Subsurface Investigation

Dear Steve Teel:

On behalf of the Port of Tacoma (the Port), Maul Foster & Alongi, Inc. (MFA) has prepared this subsurface investigation report to describe the field activities executed and data collected at the Hylebos Marsh property, located at 1212 Taylor Way in Tacoma, Washington (the Hylebos Property; see Figure 1). This investigation was conducted to characterize and refine the boundaries of the automobile shredder fluff (referred to as auto fluff in this report) present beneath the Hylebos Property, which is part of the Taylor Way and Alexander Avenue Fill Area (TWAAFA) site (the Site) (Washington State Department of Ecology [Ecology] facility ID no. 1403183; cleanup site ID no. 4692).

MFA performed field activities at the Hylebos Property consistent with the Ecology-approved *Hylebos Marsh: Subsurface Investigation Work Plan* (MFA 2024).

Background

Property Description

The Hylebos Property is currently vacant and undeveloped with low-lying vegetated areas and wetlands present. The Port has been working with Washington State Department of Agriculture and the United States Department of Agriculture to eradicate an invasive species of snail present on the Hylebos Property, *Cernuella virgata* (Vineyard Snail). The invasive snails are currently limited to the Hylebos Property.

Property History and Previous Investigations

Auto fluff originating from General Metals of Tacoma operations on the neighboring Stericycle property extends onto the Hylebos Property forming an area of sloped topography along the eastern border of the Hylebos Property (See Figure 2). Elevated concentrations of arsenic, cadmium, chromium, copper, lead, zinc, total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs) have been detected in auto fluff samples collected on other parcels within the Site (Dalton, Olmsted & Fuglevand [DOF] 2020).

Previous investigations on the Hylebos Property and Stericycle property have encountered auto fluff in the sloped area fill material along the eastern parcel boundary. Thicknesses of auto fluff ranged

from 0.75 feet thick in boring SRI-13 to 12 feet thick in boring SRI-15 (DOF 2020). Auto fluff was not identified in soil borings SRI-19, SB-3A, and TWA-SB3 located near the base of the sloped area (DOF 2020, 2022). Contaminants detected above screening levels in soil on the Stericycle Property near this sloped area included oil-range hydrocarbons, arsenic, and lead; however, no soil samples have been collected from the sloped area fill on the Hylebos Marsh Property (DOF 2020, 2022). Contaminant of concern concentrations in soil collected elsewhere from the Hylebos Marsh Property are below data gaps screening criteria (DOF 2020, 2022).

Field Investigation Activities

On August 5, 12, and 13, 2024, MFA conducted fieldwork activities in accordance with the Ecology-approved *Hylebos Marsh: Subsurface Investigation Work Plan* (Work Plan) (MFA 2024). Field photographs from the investigation are provided in Attachment A.

MFA coordinated public and private underground utility locates prior to conducting ground-disturbing field work.

Geophysical Survey and Hand Auger Borings

On August 5, 2024, under MFA oversight, hydroGEOPHYSICS, Inc., of Richland, Washington, conducted a geophysical survey using electromagnetic induction and ground-penetrating radar survey methods on the sloped portion of the Hylebos Property. The geophysical survey report is provided in Attachment B. According to hydroGEOPHYSICS, Inc., the geophysical survey identified areas of anomalous increases and decreases in magnetic susceptibility, indicative of buried auto fluff, along the central portion of the survey area. Further, high frequency soil conductivity readings were identified and assumed to be related to auto fluff eroding onto the surface from the adjacent hillside (see Attachment B).

In addition, on August 5, 2024, MFA advanced hand auger locations TWA-HA-01 through TWA-HA-03 to approximately 2 feet below ground surface (bgs) to further delineate the approximate extent of auto fluff using visual confirmation. Hand equipment was used to minimize disturbance of wetlands and associated buffers present on the Hylebos Property. No samples were collected from the hand auger locations. Hand auger location TWA-HA-01 consisted of silty sand with a transparent plastic fragment and woody debris. Hand auger locations TWA-HA-02 and TWA-HA-03 consisted of sand (see Attachment A). Auto fluff was not observed in the three hand auger locations. Field sampling data sheets for the three hand auger locations are provided in Attachment C.

The estimated extents of auto fluff based on the geophysical survey and field explorations during this investigation are depicted on Figure 3.

Direct-Push Borings

On August 12 and 13, 2024, under MFA oversight, Anderson Environmental Contracting, LLC, of Kelso, Washington, advanced eight borings (TWA-SB-09 through TWA-SB-16) via direct-push drilling methods to a maximum depth of 20 feet bgs on the Hylebos Property (see Figure 3). MFA prepared geologic boring logs for each location under the direct supervision of a geologist licensed in the State of Washington (see Attachment D). Soil types were described; visual and olfactory observations were recorded; and soil headspace was screened for organic vapors using a photoionization detector. Soil types encountered during drilling generally consisted of sandy gravel/gravelly sand with silt overlying sand with silt, silty sand, or sand to the maximum depth observed of 20 feet bgs. Fill materials

encountered during drilling included layers of woody debris and auto fluff intermixed with white powdery or paste-like material (assumed to be lime waste), and clean sand (assumed to be dredge spoils; DOF 2020). Groundwater was encountered between 2 and 19.5 feet bgs, reflecting the surface elevation changes between boring locations. Specific observations are noted in each boring log (Attachment D).

Borings TWA-SB-11 through TWA-SB-13 were advanced through the auto fluff to confirm the vertical extent of auto fluff on the Hylebos Property. In these borings, auto fluff material generally consisting of plastic, fabric, foam, rubber, wires, and metal was observed to 5.6 feet bgs in boring TWA-SB-11, to 17.5 feet bgs in boring TWA-SB-12, and to 2.8 feet bgs in boring TWA-SB-13, with no recovery from 2.8 to 5 feet bgs. TWA-SB-12 exhibited chemical-like odors and/or rancid odors between approximately 6.8 and 19.4 feet bgs and a lens of tar-like material at 16.9 feet bgs. An approximately 8-foot thick layer of woody debris was encountered in TWA-SB-11 below the auto fluff interval. Chunks of white powdery material, suggestive of lime waste, was encountered in TWA-SB-12 between 0.4 and 3 feet bgs and was comingled with auto fluff from 8.5 to 19.4 feet bgs. TWA-SB-13 also exhibited white powdery material at depths of 2.1 to 2.5 feet bgs and 5 to 6 feet bgs.

Borings TWA-SB-09, TWA-SB-10, and TWA-SB-14 through TWA-SB-16 were advanced outside of the expected extent of auto fluff down to the native soil. Fill material, consisting of woody debris and/or white chalky material were observed in borings TWA-SB-09, TWA-SB-10, and TWA-SB-14. Woody debris layers, exhibiting organic odors, were encountered in TWA-SB-09 at a depth of 1.3 to 3 feet bgs and in SB-10 at 7.4 to 8.3 feet bgs. At TWA-SB-14, approximately 0.5-foot-thick layers of white, paste-like material were encountered at 2 and 5 feet bgs. In addition, a piece rubber sheeting was observed at TWA-SB-14 at approximately 1.5 feet bgs. No other materials indicative of auto fluff (wire, metal, upholstery, tire parts, etc.) were observed in the boring and no odors were noted.

MFA collected samples in accordance with the approach outlined in the *Work Plan*: where auto fluff was encountered, MFA collected samples within the auto fluff interval and immediately below the interval. In borings where auto fluff was not encountered, MFA collected a soil sample within the vadose zone. The table below summarizes the sampling approach for each boring.

Boring Location	Auto fluff Identified	Sample collection depths (in feet bgs)
TWA-SB-09	No	5.5—6.5 (in vadose zone)
TWA-SB-10	No	6—7 (in vadose zone)
TWA-SB-11	Yes	1.2—2.2 (within auto fluff interval) 5.5—6.5 (within the wood waste immediately above the water table) 15.5—16.5 (below the wood waste and auto fluff intervals)
TWA-SB-12	Yes	7.5—8.5 (within auto fluff interval) 8.5—9.5 (within auto fluff interval) 16.4—17.4 (within auto fluff interval)[1] 18—19 (below the auto fluff)
TWA-SB-13	Yes	6.5—7.5 (beneath the auto fluff)[2]
TWA-SB-14	No	1—2 (in the vadose zone)
TWA-SB-15	No	1.2—2.2 (in the vadose zone)
TWA-SB-16	No	1—2 (in the vadose zone)

[1] A tar-like substance was identified at 16.4-17.4 feet bgs (See photograph 17). A sample was collected at this interval to characterize potential product.
[2] A sample could not be collected from the auto fluff interval in the vadose zone at TWA-SB-13 due to limited soil volume. The sample was collected between 6.5 and 7.5 feet bgs and was labeled TWA-SB-13-7.5.

Borings were backfilled with hydrated bentonite and the ground surface was restored to match existing grade following completion of sampling and logging.

Investigation-derived wastes consisting of soil cuttings and decontamination water were separately drummed, labeled, and stored on the Hylebos Property in Washington State Department of Transportation-approved containers, pending off-site disposal.

Analytical Methods and Quality Control/Quality Assurance

Samples were submitted to Friedman & Bruya, Inc., a laboratory located in Seattle, Washington and accredited by the State of Washington and the National Environmental Laboratory Accreditation.

Soil samples were analyzed for the following, consistent with the Ecology-approved *Hylebos Marsh: Subsurface Investigation Work Plan*:

- Total metals (arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, and zinc) by U.S. Environmental Protection Agency (EPA) Method 6020B.
- Gasoline-range hydrocarbons by Northwest Total Petroleum Hydrocarbons (NWTPH)-Gx.
- Diesel- and oil-range hydrocarbons by NWTPH-Dx.
- PCBs as Aroclors by EPA Method 8082A.
- Semivolatile organic compounds (SVOCs) by EPA Method 8270E.
- Volatile organic compounds (VOCs) by EPA Method 8260D.

In addition, one sample (i.e., TWA-SB-12-16.9) was submitted for analysis of hydrocarbon identification (HCID) by NWTPH-HCID due to limited sample volume for the full suite of analytes. Following receipt of the HCID results, this sample was analyzed for diesel- and motor-oil-range hydrocarbons, total metals, PCB Aroclors, and SVOCs (the sample was not analyzed for gasoline-range hydrocarbons or VOCs).

The laboratory report is provided in Attachment E. Sample analytical data and the laboratory's internal quality assurance and quality control data were reviewed to assess whether they met project-specific data quality objectives. A data validation memorandum summarizing data evaluation procedures, data usability, and deviations from specific field and/or laboratory methods is provided in Attachment F. All data, with the appropriate data qualifiers assigned, are considered acceptable for their intended use. All data collected will be uploaded to Ecology's Environmental Information Management database by October 31, 2024.

Results

Cleanup levels for the Site have not been finalized. Therefore, analytical results are screened against the site-specific screening levels provided in DOF's *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington* (DGWP, DOF 2022), referred to as the DGWP screening level in the table. Chemicals without site-specific screening levels were screened against MTCA Method A (both unrestricted land use and industrial properties) or Method B (lower of cancer and noncancer values) criteria if MTCA Method A criteria were not available. Washington state natural background concentrations for metals are provided in the table for reference.

Analytes detected above screening levels in one or more sample included diesel- and motor-oil-range hydrocarbons, metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc), PCB Aroclors, VOCs

(tetrachloroethene [PCE] and trichloroethene [TCE]), and SVOCs (bis[2-ethylhexyl]phthalate and butylbenzylphthalate) in borings TWA-SB-11, TWA-SB-12, and TWA-SB-14 (see Table).

Summary and Recommendations

A geophysical survey was conducted, hand auger borings and direct-push borings were advanced, and soil samples were analyzed for TPH, metals, PCB Aroclors, VOCs, and SVOCs to refine the extent of auto fluff and characterize it for associated contaminants in soil on the Hylebos Property.

Auto fluff was observed in borings TWA-SB-11, TWA-SB-12, and TWA-SB-13 at depths ranging from ground surface to 17.5 feet bgs. Auto fluff was not observed in hand auger locations (TWA-HA-01 through TWA-HA-03) or in the remaining borings (TWA-SB-09, TWA-SB-10, TWA-SB-14, TWA-SB-15, or TWA-SB-16). Based on the results of the investigation, the auto fluff is generally constrained to the center portion of the topographical mound that runs along the east Property boundary (See Figure 3). Based on results of sampling auto fluff and native silt collected at TWA-SB-11, contamination associated with auto fluff does not appear to be migrating into native material.

Auto fluff on the Hylebos Property exhibited concentrations of hazardous substances above screening criteria. Specifically, PCB Aroclors were detected above their respective screening levels in soil samples collected from borings TWA-SB-11 and TWA-SB-12 (DOF 2020). Samples collected from within the auto fluff interval in these borings exceeded their respective screening levels for TPH, metals, VOCs, and/or SVOCs (see Table).

In boring TWA-SB-11, contaminant exceedances were limited to the sample collected at approximately 1.7 feet bgs. Except for total copper and total zinc in the sample collected at approximately 6 feet bgs, the two deeper samples collected in this boring had no screening level exceedances.

In TWA-SB-12, PCE and TCE were detected above their respective screening levels in the samples collected at approximately 9 and 18.5 feet bgs. PCE and TCE are not COCs associated with auto fluff (DOF 2020) and are likely attributed to off-property sources.

Although boring TWA-SB-13 was advanced through auto fluff, insufficient volume was available to characterize this interval. The soil sample beneath the auto fluff interval did not exhibit concentrations of contaminants above their respective screening levels.

There were no detections above screening levels for TPH, metals, PCBs, VOCs, or SVOCs at sample locations TWA-SB-09, TWA-SB-10, TWA-SB-15, and TWA-SB-16, located outside of the approximate extent of auto fluff on the Hylebos Property. At TWA-SB-14, also located outside of the approximate extent of auto fluff, soil exhibited concentrations of total lead and total zinc exceeding their respective DGWP screening levels but at much lower concentrations than those encountered in borings where significant auto fluff was present.

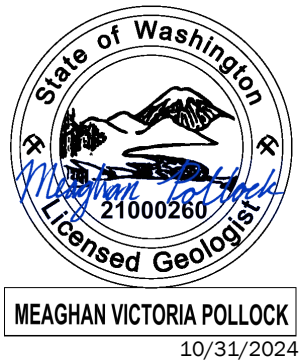
Based on the results of this investigation, the Port desires to meet with Ecology and Washington State Department of Agriculture to discuss how best to address autofluff on the Hylebos Property in concert with the urgent need to eradicate the invasive Mediterranean Vineyard Snail.

Closing

If you have any questions regarding this letter, please contact us.

Sincerely,

Maul Foster & Alongi, Inc.



Audrey Hackett
Senior Environmental Scientist

Meaghan Pollock, LG
Project Geologist

Attachments

References

Limitations

Figures

Table

A—Photograph Log

B—Geophysical Survey Report

C—Field Sampling Data Sheets

D—Boring Logs

E—Laboratory Report

F—Data Validation Memorandum

cc: Scott Hooton, Port of Tacoma
Tasya Gray, Dalton, Olmsted & Fuglevand, Inc.
Kim Seely, Coastline Law Group PLLC
Douglas Steding, Northwest Resource Law PLLC

References

DOF. 2020. *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington.* Dalton, Olmsted & Fuglevand: Seattle, WA. July.

DOF. 2022. *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington.* Dalton, Olmsted & Fuglevand: Seattle, WA. November.

MFA. 2024. *Hylebos Marsh: Subsurface Investigation Work Plan.* Prepared for the Port of Tacoma. Maul Foster & Alongi, Inc.: Seattle, WA. May 31.

Limitations

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

Figures

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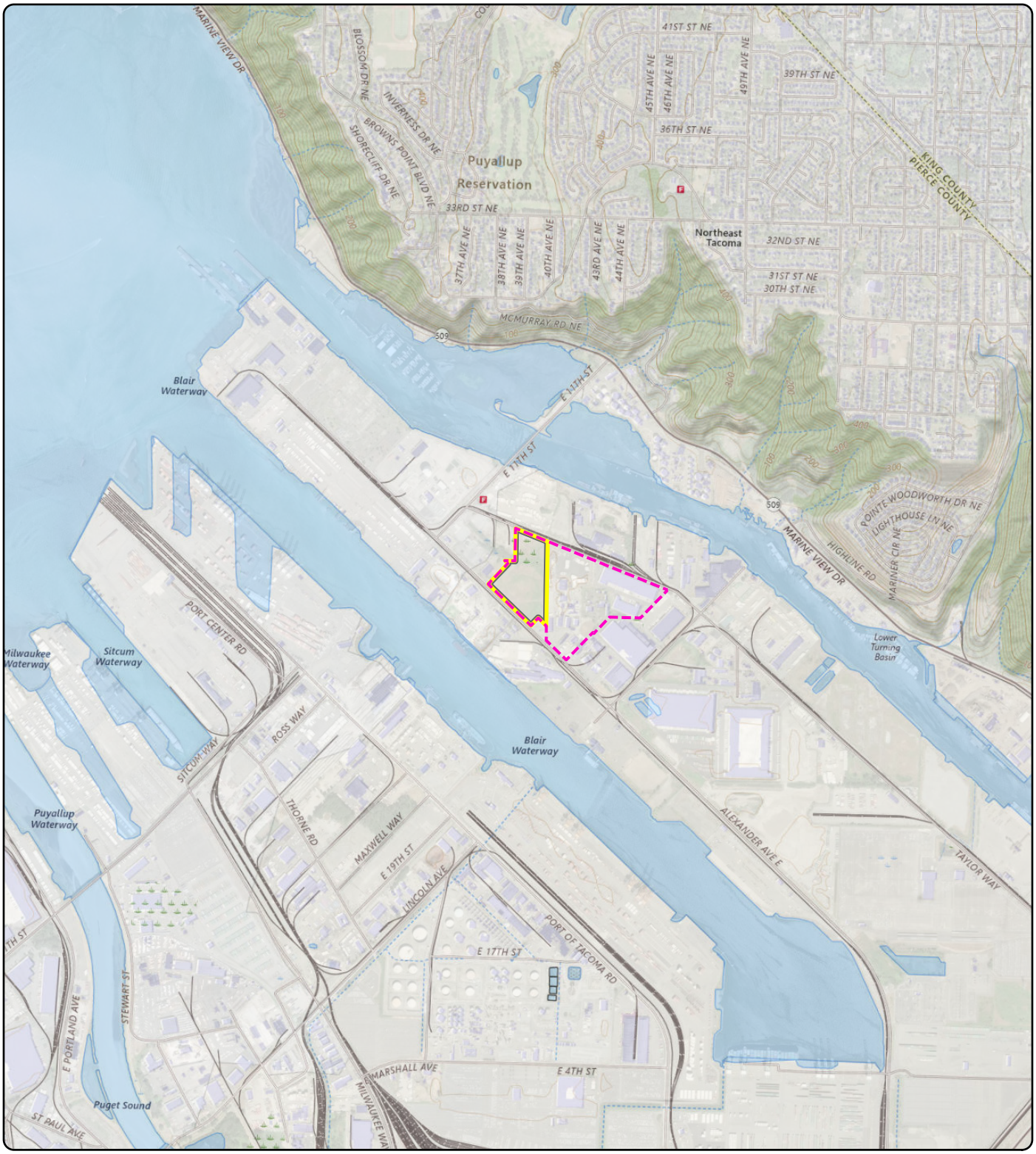

Notes
U.S. Geological Survey (2021) 7.5-minute topographic quadrangle: Tacoma.
Township 21 North, Range 3 East, Section 35.
TWAAFA = Taylor Way and Alexander Avenue Fill Area.

Data Source
Tax parcel obtained from Pierce County; TWAAFA site boundary obtained from Exhibit A of Agreed Order No. DE 14260.

Legend

- TWAAFA Site Boundary
- Hylebos Marsh Property

Figure 1
Property Location

Hylebos Marsh Property
1212 Taylor Way
Tacoma, WA

0 1,000 2,000
Feet

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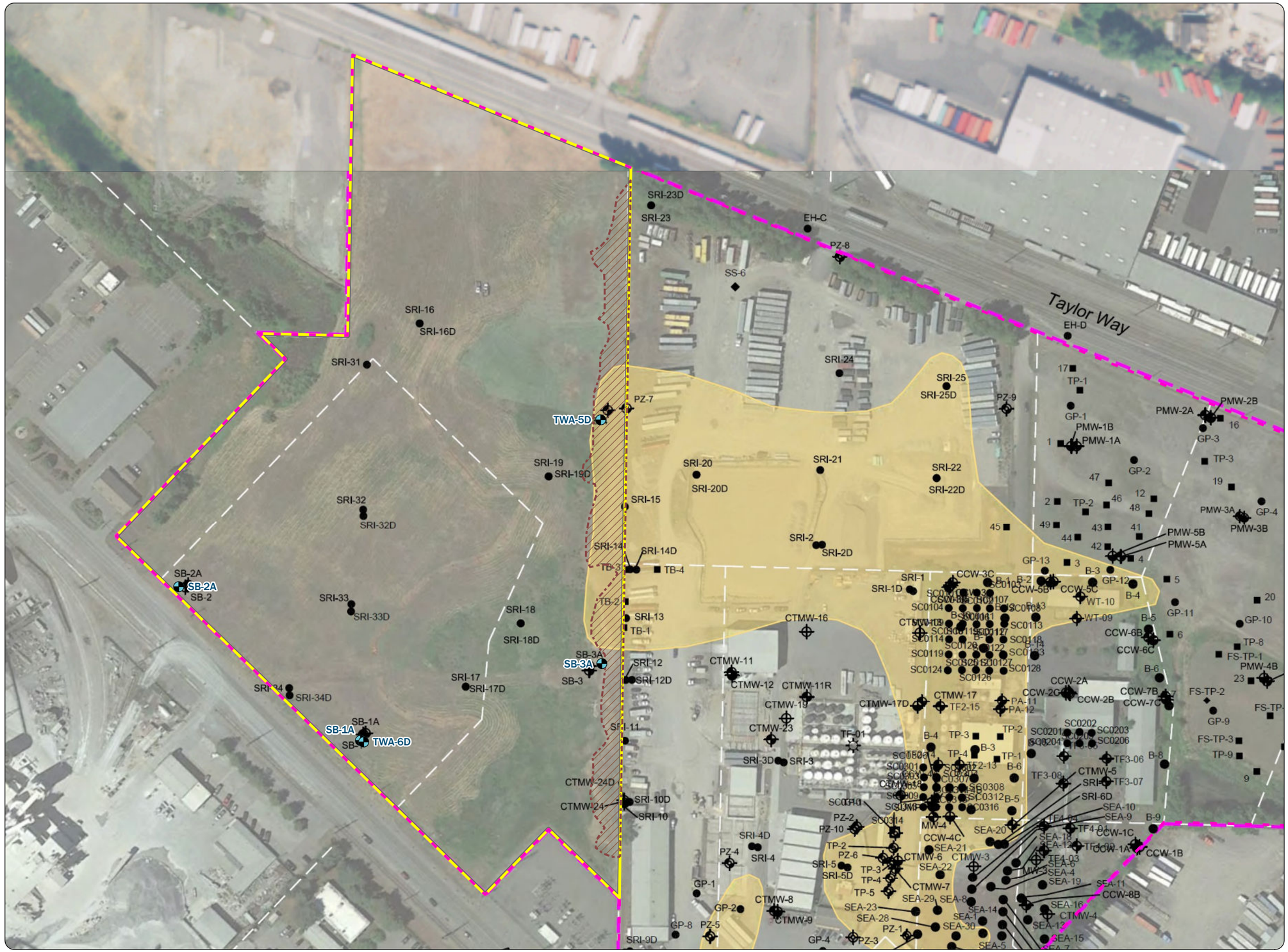
Print Date: 10/10/2024
Reviewed By: jlenahansen
Produced By: jroberts
Project: M0615.20.010

Figure 2
Previous Sample Locations

Hylebos Marsh Property
1212 Taylor Way
Tacoma, WA



Legend

- Monitoring Well
- Extent of Sloped Topography
- Approximate Extent of Auto Fluff Fill (DOF)
- TWAAFA Site Boundary
- Hylebos Marsh Property
- Parcel

Notes
DOF = Dalton, Olmsted & Fuglevand.
TWAAFA = Taylor Way and Alexander Avenue Fill Area.

0 100
Feet

Data Sources
Background image, featuring approximate extent of auto fluff fill and previous sample locations (in black), obtained from DOF Data Gaps Work Plan; parcels obtained from Pierce County; TWAAFA site boundary obtained from Exhibit A of Agreed Order No. DE 14260; extent of sloped topography on the Property was approximated by Maul Foster Alongi, Inc. based on elevated topography shown in lidar data.

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Path: X:\0615.20.14\Pro\M0615_20_014_001.aprx\Fig 2 Previous Sample Locs Hylebos Marsh
Project: M0615.20.014 Produced By: jroberts Reviewed By: cliffford Print Date: 10/11/2024

Figure 3
Sample Locations and Approximate Extent of Auto Fluff Fill

Hylebos Marsh Property
1212 Taylor Way
Tacoma, WA

Legend

- Hand Auger
- Soil Boring
- Extent of Sloped Topography
- Updated Approximate Extent of Auto Fluff Fill
- Approximate Extent of Auto Fluff Fill (DOF 2020)
- Approximate Delineated Wetland Boundary
- TWAAFA Site Boundary
- Hylebos Marsh Property
- Parcel

Notes
DOF = Dalton, Olmsted & Fuglevand.
TWAAFA = Taylor Way and Alexander Avenue Fill Area.

0 100
Feet

Data Sources
Parcels obtained from Pierce County; approximate extent of DOF's auto fluff fill obtained by 2020 Data Gaps Work Plan; updated approximate extent of auto fluff based on HGI geophysical survey and 2024 subsurface investigation results; TWAAFA site boundary obtained from Exhibit A of Agreed Order No. DE 14260; delineated wetland boundaries obtained from *Wetland Delineation Report* (10/24/2013); extent of sloped topography on the Property was approximated by Maul Foster Alongi, Inc. based on elevated topography shown in lidar data.

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Path: X:\0615.20\14\Pro\M0615_20_014_001.aprx\Fig 3 Sample Locs Approx Auto Fluff Extent Hylebos Marsh
Print Date: 10/16/2024
Reviewed By: csifford
Produced By: joberts
Project: M0615.20.014

Table

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Table
Soil Analytical Results
Subsurface Investigation, Hylebos Marsh, Port of Tacoma

Location:	DGWP Screening Level[1][2]	MTCA Method A[a][3]	MTCA Method B[b][3]	Washington State Background Metals, Puget Sound[4]	TWA-SB-09	TWA-SB-10	TWA-SB-11			TWA-SB-12				TWA-SB-13	TWA-SB-14	TWA-SB-15	TWA-SB-16
Sample Name:					TWA-SB-09-S-6.0	TWA-SB-10-S-6.5	TWA-SB-11-S-1.7	TWA-SB-11-S-6.0	TWA-SB-11-S-16.0	TWA-SB-12-S-8.0	TWA-SB-12-S-9.0	TWA-SB-12-S-16.9	TWA-SB-12-S-18.5	TWA-SB-13-S-7.5	TWA-SB-14-S-1.5	TWA-SB-15-S-1.7	TWA-SB-16-S-1.5
Sample Date:					08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/12/2024
Sample Depth (ft bgs):					6.0	6.5	1.7	6.0	16.0	8.0	9.0	16.9	18.5	7.5	1.5	1.7	1.5
Hydrocarbon Identification (detect/non-detect)																	
Gasoline	NV	NV	NV	NV	--	--	--	--	--	--	--	ND	--	--	--	--	--
Diesel	NV	NV	NV	NV	--	--	--	--	--	--	--	ND	--	--	--	--	--
Lube oil	NV	NV	NV	NV	--	--	--	--	--	--	--	DETECT	--	--	--	--	--
TPH (mg/kg)																	
Gasoline-range hydrocarbons	500	NA	NV	NV	2 U	2 U	2 U	2 U	2 U	51	14	--	39	4.6	2 U	2 U	3
Diesel-range hydrocarbons	2,000	NA	NV	NV	25 U	25 U	120	73	25 U	2,400	1,500	510	520	25 U	44	25 U	25 U
Motor-oil-range hydrocarbons	2,000	NA	NV	NV	120 U	120 U	600	120 U	120 U	8,300	3,300	1,400	1,100	120 U	120 U	120 U	120 U
Diesel+Oil[c]	NV	2,000	NV	NV	120 U	120 U	720	130	120 U	11,000	4,800	1,900	1,600	120 U	100	120 U	120 U
Total Metals (mg/kg)																	
Arsenic	7.3	NA	NA	7	1	2.5	7.7	1.4	2.7	14	12	7.9	11	1.6	6	3.1	3.4
Cadmium	NV	2	NA	1	0.2 U	0.42	5.6	0.42	0.26	13	11	5.3	6.7	0.2 U	1.2	0.23	0.2 U
Chromium	48.2	NV	NV	48	7.9	17	36	2.1	11	61	29	43	21	6.7	19	11	9.1
Copper	36.4	NV	NA	36	9.3	16	170	60	28	140	3,700	100	66	9	36	15	7.9
Lead	24	NA	NV	24	1.2	11	330	23	3.7	1,400	690	350	360	4.1	77	16	2.5
Manganese	1,500	NV	NA	1,200	59	670	340	18 J	140	600	290	330	210	52	460	160	60
Mercury	NV	2	NV	0.07	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Nickel	48.2	NV	NA	48	9.3	22	45	23 J	11	80	55	55	34	5.3	23	9.8	4.4
Selenium	NV	NV	400	NV	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Zinc	101	NV	NA	85	20	55	1,100	160 J	31	4,000	1,400	1,000	600	18	160	36	18
PCB Aroclors (mg/kg)																	
Aroclor 1016	1	NV	NA	NV	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Aroclor 1221	1	NV	NV	NV	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Aroclor 1232	1	NV	NV	NV	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Aroclor 1242	1	NV	NV	NV	0.02 U	0.02 U	0.23	0.05 U	0.02 U	1.8	1.3	0.37	0.61	0.02 U	0.02 U	0.02 U	0.02 U
Aroclor 1248	1	NV	NV	NV	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Aroclor 1254	1	NV	NA	NV	0.02 U	0.13	0.54	0.26	0.02 U	5.3	3.3	1.9	1.6	0.02 U	0.095	0.02 U	0.02 U
Aroclor 1260	1	NV	NA	NV	0.02 U	0.11	0.38	0.09 U	0.02 U	3.3	1.7	2.6	2.6	0.02 U	0.11	0.02 U	0.02 U
Aroclor 1262	1	NV	NV	NV	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Aroclor 1268	1	NV	NV	NV	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Total PCBs[d]	1	NA	NA	NV	0.02 U	0.24	1.2	0.26	0.02 U	10	6.3	4.9	4.8	0.02 U	0.21	0.02 U	0.02 U
VOCs (mg/kg)																	
1,1,1,2-Tetrachloroethane	NV	NV	38	NV	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	--	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ
1,1,1-Trichloroethane	NV	2	NA	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,1,2,2-Tetrachloroethane	NV	NV	5	NV	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	--	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ
1,1,2-Trichloroethane	NV	NV	18	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,1-Dichloroethane	NV	NV	180	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,1-Dichloroethene	NV	NV	4,000	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
1,1-Dichloropropene	NV	NV	NV	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,2,3-Trichlorobenzene	NV	NV	64	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.012 J	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,2,3-Trichloropropane	NV	NV	0.0063	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,2,4-Trichlorobenzene	NV	NV	34	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.016 J	0.02 J	--	0.017 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ

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Table
Soil Analytical Results
Subsurface Investigation, Hylebos Marsh, Port of Tacoma

Location:	DGWP Screening Level[1][2]	MTCA Method A[a][3]	MTCA Method B[b][3]	Washington State Background Metals, Puget Sound[4]	TWA-SB-09	TWA-SB-10	TWA-SB-11			TWA-SB-12				TWA-SB-13	TWA-SB-14	TWA-SB-15	TWA-SB-16
Sample Name:					TWA-SB-09-S-6.0	TWA-SB-10-S-6.5	TWA-SB-11-S-1.7	TWA-SB-11-S-6.0	TWA-SB-11-S-16.0	TWA-SB-12-S-8.0	TWA-SB-12-S-9.0	TWA-SB-12-S-16.9	TWA-SB-12-S-18.5	TWA-SB-13-S-7.5	TWA-SB-14-S-1.5	TWA-SB-15-S-1.7	TWA-SB-16-S-1.5
Sample Date:					08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/12/2024
Sample Depth (ft bgs):					6.0	6.5	1.7	6.0	16.0	8.0	9.0	16.9	18.5	7.5	1.5	1.7	1.5
1,2,4-Trimethylbenzene	305	NV	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.088	0.005 UJ	0.92	0.071	--	0.071	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,2-Dibromo-3-chloropropane	NV	NV	0.23	NV	0.049 UJ	0.049 UJ	0.049 UJ	0.049 UJ	0.049 UJ	0.049 UJ	0.049 UJ	--	0.049 UJ	0.049 UJ	0.049 UJ	0.049 UJ	0.049 UJ
1,2-Dibromoethane	NV	0.005	NA	NV	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2-Dichlorobenzene	49.2	NV	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.0057 J	0.0053 J	--	0.0059 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,2-Dichloroethane	NV	NV	11	NV	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	--	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
1,2-Dichloropropane	NV	NV	27	NV	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	--	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ
1,3,5-Trimethylbenzene	120	NV	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.022 J	0.005 UJ	0.41	0.0275 J	--	0.023 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,3-Dichlorobenzene	NV	NV	NV	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
1,3-Dichloropropane	NV	NV	1,600	NV	0.007 UJ	0.007 UJ	0.007 UJ	0.007 UJ	0.007 UJ	0.007 UJ	0.007 UJ	--	0.007 UJ	0.007 UJ	0.007 UJ	0.007 UJ	0.007 UJ
1,4-Dichlorobenzene	NV	NV	190	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.0092 J	--	0.0095 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
2,2-Dichloropropane	NV	NV	NV	NV	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	--	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ	0.013 UJ
2-Butanone	NV	NV	48,000	NV	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	--	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ	0.47 UJ
2-Chlorotoluene	NV	NV	1,600	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.021 J	--	0.019 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
2-Hexanone	NV	NV	400	NV	0.43 UJ	0.43 UJ	0.43 UJ	0.43 UJ	0.43 UJ	0.43 UJ	0.43 UJ	--	0.43 UJ	0.43 UJ	0.43 UJ	0.43 UJ	0.43 UJ
4-Chlorotoluene	NV	NV	1,600	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.0083 J	--	0.012 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
4-Isopropyltoluene	423	NV	NV	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.0092 J	0.0064 J	0.089	0.022 J	--	0.019 J	0.005 UJ	0.005 UJ	0.005 UJ	0.0075 J
4-Methyl-2-pentanone	NV	NV	6,400	NV	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	--	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ	0.24 UJ
Acetone	NV	NV	72,000	NV	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	--	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Benzene	0.0274	NA	NA	NV	0.002 U	0.002 U	0.002 U	0.012	0.0035	0.014	0.012	--	0.024	0.002 U	0.002 U	0.002 U	0.002 U
Bromobenzene	NV	NV	640	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Bromodichloromethane	NV	NV	16	NV	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	--	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ
Bromoform	NV	NV	130	NV	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	--	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ
Bromomethane	NV	NV	110	NV	0.095 UJ	0.095 UJ	0.095 UJ	0.095 UJ	0.095 UJ	0.095 UJ	0.095 UJ	--	0.095 UJ	0.095 UJ	0.095 UJ	0.095 UJ	0.095 UJ
Carbon tetrachloride	NV	NV	14	NV	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	--	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ	0.008 UJ
Chlorobenzene	NV	NV	1,600	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.008 J	--	0.025	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Chloroethane	NV	NV	NV	NV	0.07 UJ	0.07 UJ	0.07 UJ	0.07 UJ	0.07 UJ	0.07 UJ	0.07 UJ	--	0.07 UJ	0.07 UJ	0.07 UJ	0.07 UJ	0.07 UJ
Chloroform	NV	NV	32	NV	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ	--	0.0098 J	0.006 UJ	0.006 UJ	0.006 UJ	0.006 UJ
VOCs cont. (mg/kg)																	
Chloromethane	NV	NV	NV	NV	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ	--	0.0074 J	0.044 UJ	0.044 UJ	0.044 UJ	0.044 UJ
cis-1,2-Dichloroethene	NV	NV	160	NV	0.002 U	0.002 U	0.002 U	0.0017	0.002 U	0.0097	0.008	--	0.068	0.002 U	0.002 U	0.002 U	0.002 U
cis-1,3-Dichloropropene	NV	NV	NV	NV	0.0055 UJ	0.0055 UJ	0.0055 UJ	0.0055 UJ	0.0055 UJ	0.0055 UJ	0.0055 UJ	--	0.0055 UJ	0.0055 UJ	0.0055 UJ	0.0055 UJ	0.0055 UJ
Dibromochloromethane	NV	NV	12	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Dibromomethane	NV	NV	800	NV	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	--	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ	0.0065 UJ
Dichlorodifluoromethane (Freon 12)	NV	NV	16,000	NV	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	--	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ	0.01 UJ
Ethylbenzene	6.05	NA	NA	NV	0.002 U	0.002 U	0.002 U	0.0087	0.002 U	0.58	0.077	--	0.044	0.002 U	0.002 U	0.002 U	0.002 U
Hexachlorobutadiene	NV	NV	13	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.011 J	--	0.015 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Isopropylbenzene	749	NV	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.048 J	0.005 UJ	0.13	0.018 J	--	0.014 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
m,p-Xylene	13.1	NV	NV	NV	0.004 U	0.004 U	0.004 U	0.057	0.004 U	0.62	0.1	--	0.062	0.004 U	0.004	0.004 U	0.004 U
Methyl tert-butyl ether	NV	0.1	NA	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Methylene chloride	NV	0.02	NA	NV	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	--	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ
Naphthalene	86	NA	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.043	0.015	0.47	0.19	--	0.23	0.005 UJ	0.0075 J	0.005 UJ	0.005 UJ
n-Hexane	NV	NV	4,800	NV	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	--	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ

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Table
Soil Analytical Results
Subsurface Investigation, Hylebos Marsh, Port of Tacoma

Location:	DGWP Screening Level[1][2]	MTCA Method A[a][3]	MTCA Method B[b][3]	Washington State Background Metals, Puget Sound[4]	TWA-SB-09	TWA-SB-10	TWA-SB-11			TWA-SB-12				TWA-SB-13	TWA-SB-14	TWA-SB-15	TWA-SB-16
Sample Name:					TWA-SB-09-S-6.0	TWA-SB-10-S-6.5	TWA-SB-11-S-1.7	TWA-SB-11-S-6.0	TWA-SB-11-S-16.0	TWA-SB-12-S-8.0	TWA-SB-12-S-9.0	TWA-SB-12-S-16.9	TWA-SB-12-S-18.5	TWA-SB-13-S-7.5	TWA-SB-14-S-1.5	TWA-SB-15-S-1.7	TWA-SB-16-S-1.5
Sample Date:					08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/12/2024
Sample Depth (ft bgs):					6.0	6.5	1.7	6.0	16.0	8.0	9.0	16.9	18.5	7.5	1.5	1.7	1.5
n-Propylbenzene	45.4	NV	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.016 J	0.005 UJ	0.17	0.014 J	--	0.014 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
o-Xylene	13.1	NV	NA	NV	0.002 U	0.002 U	0.002 U	0.035	0.002 U	0.43	0.057	--	0.032	0.002 U	0.0025	0.002 U	0.002 U
sec-Butylbenzene	17.4	NV	NA	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.043 J	0.0064 J	--	0.006 J	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Styrene	NV	NV	16,000	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 U	0.005 UJ	0.087	0.064	--	0.053	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
tert-Butylbenzene	NV	NV	8,000	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Tetrachloroethene (PCE)	0.0499	NA	NA	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0035	0.082	--	0.49	0.002 U	0.002 U	0.002 U	0.002 U
Toluene	4.52	NA	NA	NV	0.002 U	0.002 U	0.002 U	0.068	0.014	0.13	0.045	--	0.069	0.002 U	0.0046	0.002 U	0.002 U
trans-1,2-Dichloroethene	NV	NV	1,600	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0094	0.002 U	--	0.0024	0.002 U	0.002 U	0.002 U	0.002 U
trans-1,3-Dichloropropene	NV	NV	NV	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	--	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Trichloroethene (TCE)	0.0254	NA	NA	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0056	0.028	--	0.64	0.002 U	0.002 U	0.002 U	0.002 U
Trichlorofluoromethane (Freon 11)	NV	NV	24,000	NV	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ	0.012 J	0.081 J	--	1.7	0.005 UJ	0.005 UJ	0.005 UJ	0.005 UJ
Vinyl chloride	0.00167	NV	NA	NV	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Xylenes (total)[e]	13.1	NA	NA	NV	0.004 U	0.004 U	0.004 U	0.092	0.004 U	1.1	0.16	--	0.094	0.004 U	0.0065	0.004 U	0.004 U
SVOCs (mg/kg)																	
1,2,4-Trichlorobenzene	NV	NV	34	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
1,2-Dichlorobenzene	NV	NV	7,200	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
1,2-Diphenylhydrazine	NV	NV	1.3	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
1,3-Dichlorobenzene	NV	NV	NV	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
1,4-Dichlorobenzene	NV	NV	190	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
1-Methylnaphthalene	NV	NV	34	NV	0.0025 U	0.0025 U	0.012 U	0.0027	0.0025 U	0.47	0.16	0.24	0.061	0.0025 U	0.012 U	0.0025 U	0.0025 U
2,4,5-Trichlorophenol	NV	NV	8,000	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
2,4,6-Trichlorophenol	NV	NV	80	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
2,4-Dichlorophenol	NV	NV	240	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
2,4-Dimethylphenol	NV	NV	1,600	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
2,4-Dinitrophenol	NV	NV	160	NV	1.5 U	1.5 U	7.5 U	1.5 U	1.5 U	30 U	7.5 U	7.5 U	7.5 U	1.5 U	7.5 U	1.5 U	1.5 U
2,4-Dinitrotoluene	NV	NV	3.2	NV	0.25 U	0.25 U	1.2 U	0.25 U	0.25 U	5 U	1.2 U	1.2 U	1.2 U	0.25 U	1.2 U	0.25 U	0.25 U
2,6-Dinitrotoluene	NV	NV	0.67	NV	0.25 U	0.25 U	1.2 U	0.25 U	0.25 U	5 U	1.2 U	1.2 U	1.2 U	0.25 U	1.2 U	0.25 U	0.25 U
2-Chloronaphthalene	NV	NV	6,400	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
2-Chlorophenol	NV	NV	400	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
2-Methylnaphthalene	27.7	NV	NA	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.74	0.25	0.38	0.095	0.0025 U	0.012 U	0.0025 U	0.0025 U
2-Methylphenol	NV	NV	4,000	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
2-Nitroaniline	NV	NV	800	NV	0.25 U	0.25 U	1.2 U	0.25 U	0.25 U	5 U	1.2 U	1.2 U	1.2 U	0.25 U	1.2 U	0.25 U	0.25 U
2-Nitrophenol	NV	NV	NV	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
3- & 4-Methylphenol (m,p-Cresol)	NV	NV	NV	NV	1 U	1 U	5 U	1 U	1 U	20 U	5 U	5 U	5 U	1 U	5 U	1 U	1 U
3,3-Dichlorobenzidine	NV	NV	2.2	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
3-Nitroaniline	NV	NV	NV	NV	5 U	5 U	25 U	5 U	5 U	100 U	25 U	25 U	25 U	5 U	25 U	5 U	5 U
4,6-Dinitro-2-methylphenol	NV	NV	6.4	NV	1.5 U	1.5 U	7.5 U	1.5 U	1.5 U	30 U	7.5 U	7.5 U	7.5 U	1.5 U	7.5 U	1.5 U	1.5 U
4-Bromophenylphenyl ether	NV	NV	NV	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
4-Chloro-3-methylphenol	NV	NV	8,000	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
4-Chloroaniline	NV	NV	5	NV	5 U	5 U	25 U	5 U	5 U	100 U	25 U	25 U	25 U	5 U	25 U	5 U	5 U
4-Chlorophenylphenyl ether	NV	NV	NV	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
4-Nitroaniline	NV	NV	50	NV	5 U	5 U	25 U	5 U	5 U	100 U	25 U	25 U	25 U	5 U	25 U	5 U	5 U

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Table
Soil Analytical Results
Subsurface Investigation, Hylebos Marsh, Port of Tacoma

Location:	DGWP Screening Level[1][2]	MTCA Method A[a][3]	MTCA Method B[b][3]	Washington State Background Metals, Puget Sound[4]	TWA-SB-09	TWA-SB-10	TWA-SB-11			TWA-SB-12				TWA-SB-13	TWA-SB-14	TWA-SB-15	TWA-SB-16
Sample Name:					TWA-SB-09-S-6.0	TWA-SB-10-S-6.5	TWA-SB-11-S-1.7	TWA-SB-11-S-6.0	TWA-SB-11-S-16.0	TWA-SB-12-S-8.0	TWA-SB-12-S-9.0	TWA-SB-12-S-16.9	TWA-SB-12-S-18.5	TWA-SB-13-S-7.5	TWA-SB-14-S-1.5	TWA-SB-15-S-1.7	TWA-SB-16-S-1.5
Sample Date:					08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/12/2024
Sample Depth (ft bgs):					6.0	6.5	1.7	6.0	16.0	8.0	9.0	16.9	18.5	7.5	1.5	1.7	1.5
4-Nitrophenol	NV	NV	NV	NV	1.5 U	1.5 U	7.5 U	1.5 U	1.5 U	30 U	7.5 U	7.5 U	7.5 U	1.5 U	7.5 U	1.5 U	1.5 U
Acenaphthene	70.3	NV	NA	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.13	0.11	0.062	0.058	0.0025 U	0.027	0.0029	0.0025 U
Acenaphthylene	NV	NV	NV	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.05 U	0.012 U	0.012 U	0.012 U	0.0025 U	0.036	0.0087	0.0025 U
Anthracene	6,730	NV	NA	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.057	0.076	0.046	0.098	0.0025 U	0.23	0.031	0.0025 U
Benzo(a)anthracene	5.14	NV	NV	NV	0.005 U	0.005 U	0.025 U	0.005 U	0.005 U	0.22	0.2	0.27	0.2	0.005 U	1	0.071	0.005 U
Benzo(a)pyrene	5.14	NA	NA	NV	0.0025 U	0.0025 U	0.045	0.0025 U	0.0025 U	0.23	0.14	0.3	0.17	0.0025 U	1.1	0.11	0.0025 U
Benzo(b)fluoranthene	NV	NV	NV	NV	0.0025 U	0.003	0.048	0.0025 U	0.0025 U	0.28	0.19	0.36	0.23	0.0025 U	2.3	0.21	0.0025 U
Benzo(ghi)perylene	NV	NV	NV	NV	0.005 UJ	0.005 UJ	0.1	0.005 UJ	0.005 UJ	0.4	0.18	0.3	0.12	0.005 UJ	0.47	0.072 J	0.005 UJ
Benzo(k)fluoranthene	NV	NV	NV	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.07	0.047	0.13	0.086	0.0025 U	0.75	0.071	0.0025 U
SVOCs cont. (mg/kg)																	
Benzoic acid	NV	NV	320,000	NV	2.5 U	2.5 U	12 UJ	2.5 U	2.5 U	50 UJ	12 UJ	12 U	12 UJ	2.5 U	12 UJ	2.5 U	2.5 U
Benzyl alcohol	NV	NV	8,000	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
Bis(2-chloro-1-methylethyl)ether	NV	NV	14	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Bis(2-chloroethoxy)methane	NV	NV	240	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Bis(2-chloroethyl)ether	NV	NV	0.91	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Bis(2-ethylhexyl)phthalate	13.4	NV	NA	NV	0.8 U	0.8 U	17	0.8 U	0.8 U	320	9.1	100	11	0.8 U	4 U	0.8 U	0.8 U
Butylbenzylphthalate	12.8	NV	NA	NV	0.5 U	0.5 U	6.7	0.5 U	0.5 U	29	2.9	5.7	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
Carbazole	16.9	NV	NV	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.05 U	0.042	0.033	0.039	0.0025 U	0.031	0.0072	0.0025 U
Chrysene	5.14	NV	NV	NV	0.0025 U	0.0034	0.056	0.0025 U	0.0025 U	0.45	0.39	0.46	0.28	0.0025 U	1.9	0.18	0.0056
Dibenzo(a,h)anthracene	NV	NV	NV	NV	0.005 U	0.005 U	0.025 U	0.005 U	0.005 U	0.1 U	0.031	0.051	0.025 U	0.005 U	0.12	0.015	0.005 U
Dibenzofuran	NV	NV	80	NV	0.0025 U	0.0025 U	0.012 U	0.0027	0.0025 U	0.05 U	0.069	0.035	0.052	0.0025 U	0.013	0.0032	0.0025 U
Diethyl phthalate	72.2	NV	NA	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
Dimethyl phthalate	NV	NV	NV	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
Di-n-butyl phthalate	NV	NV	8,000	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	10 U	2.5 U	2.5 U	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
Di-n-octyl phthalate	NV	NV	800	NV	0.5 U	0.5 U	2.5 U	0.5 U	0.5 U	19	2.5 U	6.7	2.5 U	0.5 U	2.5 U	0.5 U	0.5 U
Fluoranthene	88.9	NV	NA	NV	0.0025 U	0.0054	0.027	0.0028	0.0025 U	0.35	0.36	0.34	0.36	0.0025 U	1.6	0.067	0.0025 U
Fluorene	433	NV	NA	NV	0.0025 U	0.0025 U	0.012 U	0.0025 U	0.0025 U	0.12	0.14	0.077	0.092	0.0025 U	0.023	0.0051	0.0025 U
Hexachlorobenzene	NV	NV	0.63	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.28	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Hexachlorobutadiene	0.605	NV	NA	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Hexachlorocyclopentadiene	NV	NV	480	NV	0.15 UJ	0.15 UJ	0.75 U	0.15 UJ	0.15 UJ	3 U	0.75 U	0.75 UJ	0.75 U	0.15 UJ	0.75 U	0.15 UJ	0.15 UJ
Hexachloroethane	NV	NV	25	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Indeno(1,2,3-cd)pyrene	NV	NV	NV	NV	0.005 U	0.005 U	0.036	0.005 U	0.005 U	0.16	0.085	0.17	0.093	0.005 U	0.49	0.073	0.005 U
Isophorone	NV	NV	1,100	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Naphthalene	86	NA	NA	NV	0.005 U	0.005 U	0.025 U	0.0059	0.005 U	0.36	0.18	0.18	0.092	0.005 U	0.025 U	0.0072	0.005 U
Nitrobenzene	NV	NV	160	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
N-Nitrosodimethylamine	NV	NV	0.0037	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
N-Nitrosodiphenylamine	NV	NV	200	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.28	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
N-Nitrosodipropylamine	NV	NV	0.14	NV	0.05 U	0.05 U	0.25 U	0.05 U	0.05 U	1 U	0.25 U	0.25 U	0.25 U	0.05 U	0.25 U	0.05 U	0.05 U
Pentachlorophenol	NV	NV	2.5	NV	0.25 U	0.25 U	1.2 U	0.25 U	0.25 U	5 U	1.2 U	1.2 U	1.2 U	0.25 U	1.2 U	0.25 U	0.25 U
Phenanthrene	64.5	NV	NV	NV	0.0025 U	0.0058	0.028	0.0054	0.0025 U	0.48	0.56	0.3	0.44	0.0025 U	0.18	0.03	0.0025 U
Phenol	NV	NV	24,000	NV	0.25 U	0.25 U	1.2 U	0.25 U	0.25 U	5 U	1.2 U	1.2 U	1.2 U	0.25 U	1.2 U	0.25 U	0.25 U
Pyrene	822	NV	NA	NV	0.0025 U	0.0066	0.065	0.004	0.0025 U	0.85	0.79	0.53	0.52	0.0025 U	3.8	0.057	0.0025 U

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Table
Soil Analytical Results
Subsurface Investigation, Hylebos Marsh, Port of Tacoma

Location:	DGWP Screening Level[1][2]	MTCA Method A[a][3]	MTCA Method B[b][3]	Washington State Background Metals, Puget Sound[4]	TWA-SB-09	TWA-SB-10	TWA-SB-11			TWA-SB-12				TWA-SB-13	TWA-SB-14	TWA-SB-15	TWA-SB-16
Sample Name:					TWA-SB-09-S-6.0	TWA-SB-10-S-6.5	TWA-SB-11-S-1.7	TWA-SB-11-S-6.0	TWA-SB-11-S-16.0	TWA-SB-12-S-8.0	TWA-SB-12-S-9.0	TWA-SB-12-S-16.9	TWA-SB-12-S-18.5	TWA-SB-13-S-7.5	TWA-SB-14-S-1.5	TWA-SB-15-S-1.7	TWA-SB-16-S-1.5
Sample Date:					08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/12/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/13/2024	08/12/2024
Sample Depth (ft bgs):					6.0	6.5	1.7	6.0	16.0	8.0	9.0	16.9	18.5	7.5	1.5	1.7	1.5
Naphthalenes, total[f]	86	NA	NA	NV	0.005 U	0.005 U	0.025 U	0.0099	0.005 U	1.6	0.59	0.8	0.25	0.005 U	0.025 U	0.0097	0.005 U
cPAH TEQ[g][5]	5.14	NA	NA	NV	0.005 U	0.005 U	0.057	0.005 U	0.005 U	0.31	0.20	0.40	0.23	0.005 U	1.6	0.16	0.0023

Table
Soil Analytical Results
Subsurface Investigation, Hylebos Marsh, Port of Tacoma

Notes

Data summation rules are as follows: non-detect results are multiplied by one-half (except for PCB Aroclors) when used for sums or TEQ calculations. When all results are non-detect, the highest reporting limit is provided as the sum or TEQ.

Analytical results are preliminarily screened to DGWP screening levels (including Data Gaps Data Report screening levels when a DGWP screening level is unavailable). If a DGWP screening level is unavailable, MTCA Method A followed by MTCA Method B were used. Washington state background metals values are shown for reference only and are not shaded for exceedances.

Shading (color key below) indicates values that exceed screening criteria; non-detects (U, UJ) were not compared with screening criteria.

DGWP Screening Level

MTCA Method A (Unrestricted Land Use/Industrial Properties)

-- = not analyzed.

cPAH = carcinogenic polycyclic aromatic hydrocarbon.

DGWP = data gaps work plan.

ft bgs = feet below ground surface.

J = result is estimated.

mg/kg = milligrams per kilogram.

MTCA = Model Toxics Control Act.

NA = not applicable.

ND = not detected.

NV = no value.

PCB = polychlorinated biphenyl.

SVOC = semivolatile organic compound.

TEQ = toxicity equivalency.

TPH = total petroleum hydrocarbons.

U = result is non-detect at the method reporting limit.

UJ = result is non-detect with an estimated method reporting limit.

VOC = volatile organic compound.

[a]MTCA Method A values for unrestricted land use and industrial properties are shown (when a DGWP value is unavailable). For the analytes shown, unrestricted land use and industrial properties screening levels have the same value.

[b]Lower of cancer and noncancer values are shown.

[c]Diesel+Oil is the sum of diesel- and oil-range hydrocarbons.

[d]Total PCBs is the sum of all PCB Aroclors. Non-detect results are not included in the sum.

[e]Total xylenes is the sum of m,p-xylene and o-xylene.

[f]Total naphthalenes is the sum of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene.

[g]cPAH TEQ calculated as the sum of each cPAH concentration multiplied by the corresponding toxic equivalent factor.

References

[1]DOF. 2020. *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington.* Dalton, Olmsted, & Fuglevand: Seattle, Washington. July.

[2]DOF. 2022. *Data Gaps Data Report, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington.* Dalton, Olmsted, & Fuglevand: Seattle, Washington. November.

[3]Ecology. 2024. *Cleanup Levels and Risk Calculation (CLARC) table.* Washington State Department of Ecology, Toxics Cleanup Program. July.

[4]Ecology. 1994. *Natural Background Soil Metals Concentrations in Washington State.* Publication 94-115. Washington State Department of Ecology. October.

[5]Ecology. 2015. *Implementation Memorandum #10: Evaluating the Human Health Toxicity of Carcinogenic PAHs (cPAHs) Using Toxicity Equivalency Factors (TEFs)* . Publication No. 15-09-049. Washington State Department of Ecology, Toxics Cleanup Program. April 20.

Attachment A

Photograph Log

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Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 1.

Description

View of Property, facing north. Photograph taken during field activities on August 5, 2024.

Photo No. 2.

Description

TWA-HA-01 location, facing northeast. Photograph taken during field activities on August 5, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 3.

Description

TWA-HA-01 hand auger soil core from 0 to 2 feet below ground surface (bgs). Photograph taken during field activities on August 5, 2024.

Photo No. 4.

Description

TWA-HA-01 plastic observed at 0 to 6-inch bgs interval. Photograph taken during field activities on August 5, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 5.

Description

TWA-HA-01 wood debris observed at approximately 1.5 feet bgs. Photograph taken during field activities on August 5, 2024.

Photo No. 6.

Description

TWA-HA-02 hand auger soil core from 0 to 2 feet bgs. Photograph taken during field activities on August 5, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 7.

Description

TWA-HA-03 hand auger soil core from 0 to 2 feet bgs. Photograph taken during field activities on August 5, 2024.

Photo No. 8.

Description

TWA-SB-09 soil core from 0 to 5 feet bgs. Note woody debris beginning at approximately 1.3 feet bgs. Photograph taken during field activities on August 12, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 9.

Description

TWA-SB-09 soil core from 5 to 10 feet bgs (upper). Note sample collected at 5.5 to 6.5 feet bgs. Photograph taken during field activities on August 12, 2024.

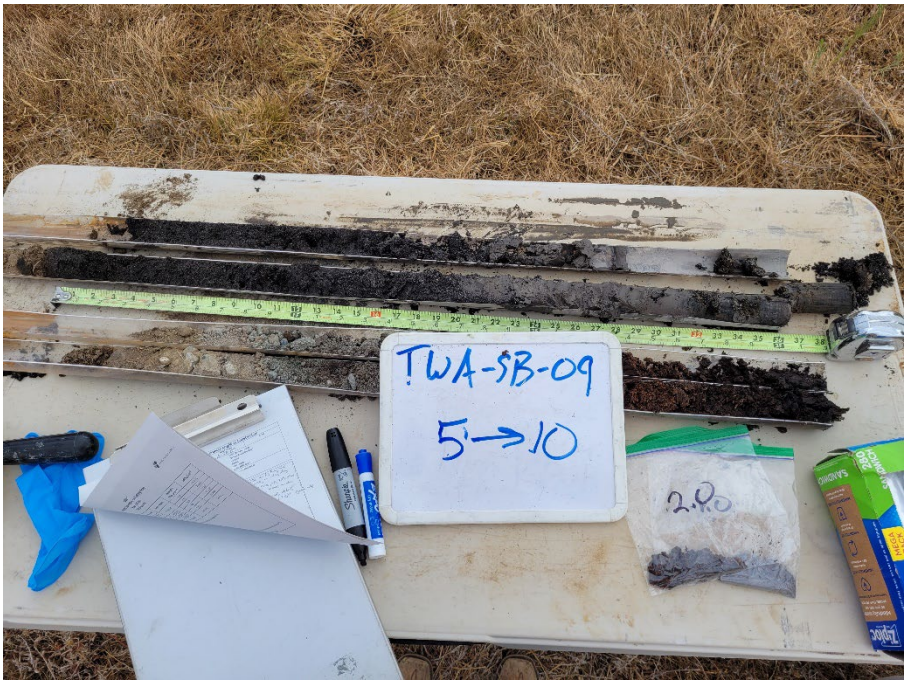
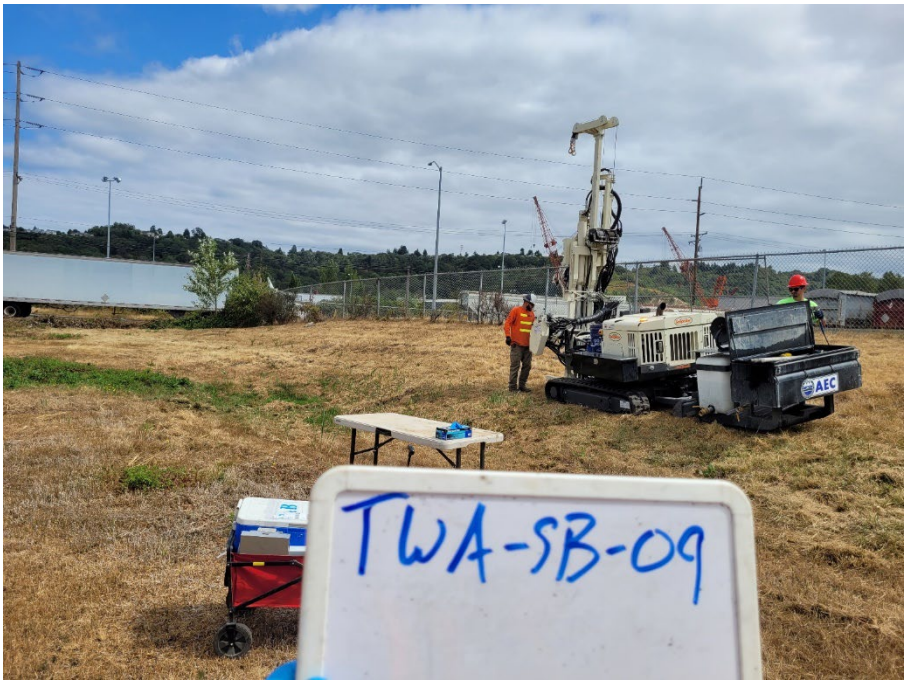


Photo No. 10.

Description

TWA-SB-9 boring location, facing northeast. Photograph taken during field activities on August 12, 2024.



Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 11.

Description

TWA-SB-10 soil core from 5 to 10 feet bgs. Note sample collected at 6 to 7 feet bgs. Photograph taken during field activities on August 12, 2024.

Photo No. 12.

Description

TWA-SB-10 boring location, facing north. Photograph taken during field activities on August 12, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 13.

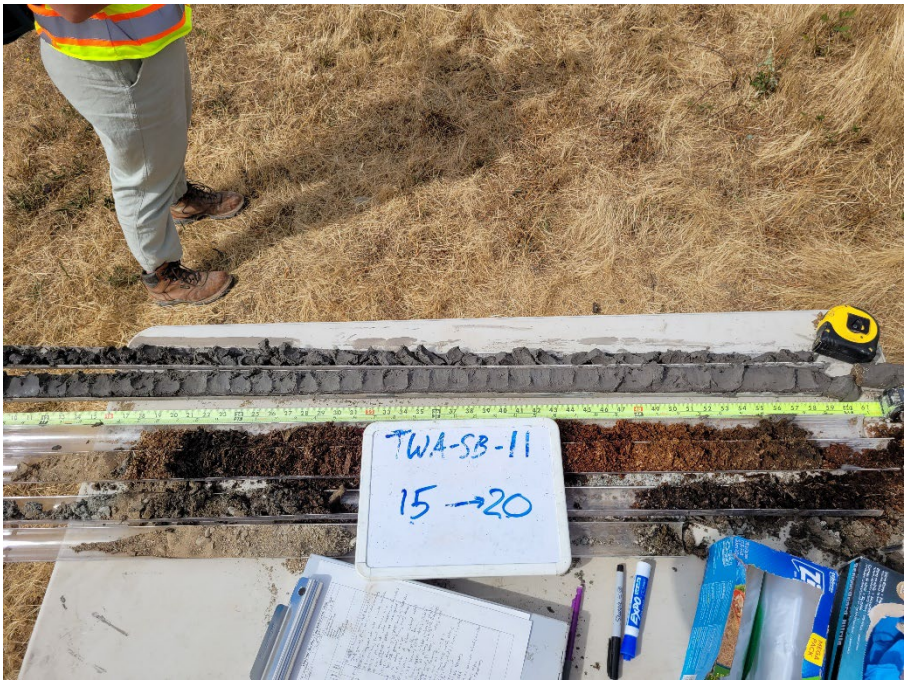
Description

TWA-SB-11 0 to 5 feet bgs core (bottom two rows; note core is split) and 5 to 10 foot core (top). Auto fluff observed at approximately 2.1 feet bgs. Woody debris observed 5.6 to 8.4 feet bgs. Photograph taken during field activities on August 13, 2024.

Photo No. 14.

Description

TWA-SB-11 soil core from 15 to 20 feet bgs (top core). Note sample collected at 15.5 to 16.5 feet bgs, beneath wood waste and auto fluff intervals. Photograph taken during field activities on August 13, 2024.



Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 15.

Description

TWA-SB-11 boring location, facing northeast. Note auto fluff on the ground surface at the base of monitoring well TWA-5 in foreground. Photograph taken during field activities on August 13, 2024.

Photo No. 16.

Description

TWA-SB-12 soil core from 5 to 10 feet bgs (top core). Note auto fluff beginning at approximately 6.8 feet bgs. Photograph taken during field activities on August 13, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 17.

Description

TWA-SB-12 tar-coated wire at 16.9 feet bgs. Note sample collected at 16.4 to 17.4 feet bgs. Photograph taken during field activities on August 13, 2024.

Photo No. 18.

Description

TWA-SB-12 boring location, facing south. Photograph taken during field activities on August 13, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 19.

Description

TWA-SB-13 soil core from 0 to 5 feet bgs. Note auto fluff and wood waste observed at approximately 2.5 feet in soil core. Photograph taken during field activities on August 13, 2024.

Photo No. 20.

Description

TWA-SB-13 boring location, facing south. Photograph taken during field activities on August 13, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 21.

Description

TWA-SB-14 chalky white material overlying sand (right side of photo) observed at approximately 2 feet bgs. Photograph taken during field activities on August 13, 2024.

Photo No. 22.

Description

TWA-SB-14 boring location, facing south. Photograph taken during field activities on August 13, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 23.

Description

TWA-SB-15 soil core from 0 to 5 feet bgs. Note no auto fluff was observed in boring. Note sample collected at 1.2 to 2.2 feet bgs Photograph taken during field activities on August 13, 2024.

Photo No. 24.

Description

TWA-SB-15 boring location, facing southeast. Photograph taken during field activities on August 13, 2024.

Photographs

Project Name: Hylebos Marsh Subsurface Investigation
Project Number: M0615.20.014
Location: 1212 Taylor Way, Tacoma, WA

Photo No. 25.

Description

TWA-SB-16 soil core from 0 to 5 feet bgs. Note no auto fluff was observed in boring. Note sample collected at 1 to 2 feet bgs. Photograph taken during field activities on August 13, 2024.

Photo No. 26.

Description

TWA-SB-16 boring location, facing northeast. Photograph taken during field activities on August 13, 2024.

Attachment B

Geophysical Survey Report

MAUL FOSTER ALONGI

RPT-2024-056

HYLEBOS MARSH SITE CLEARANCE - ELECTROMAGNETIC AND GROUND PENETRATING RADAR SURVEY– TACOMA WASHINGTON

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TABLE OF CONTENTS

1.0 INTRODUCTION

A geophysical characterization survey was performed by hydroGEOPHYSICS, Inc. (HGI) at the Hylebos Marsh property located in Tacoma, Washington. The primary concern at the property is the extent of suspected buried auto fluff (byproducts of auto scrapping), in anticipation of drilling soil borings in the area. The property was previously utilized as an unpermitted landfill containing auto-fluff, wood waste, and other lime wastes throughout the survey area.

HGI conducted two geophysical methods to investigate the subsurface over the area of interest at the site. The first method was electromagnetic induction (EM), which was utilized as the primary method for identifying subsurface anomalies in the survey area. The ground penetrating radar (GPR) method was applied as a complementary method to the EM to detect anomalies in the subsurface in areas where the EM tool may be susceptible to surface interference, i.e., near the boundary fence and transformer substation.

1.1 OBJECTIVE

The primary objective of the geophysical characterization was to identify and delineate auto fluff and other subsurface debris within the survey zone.

1.2 SCOPE OF WORK

The scope of the geophysical characterization included EM data acquisition over an approximately 75 by 1,000 feet area of interest at the Hylebos Marsh property. This was overlapped by six (6) parallel survey lines of GPR data collected with intermittent gaps due to limited access from dense vegetation onsite. The GPR data collection was targeted in areas expected to have diminished EM data quality due to surface interference sources. The GPR survey lines varied in length based on access constraints and obstructions at the site but were generally between approximately 1,200 and 1,000 feet in length.

1.3 SURVEY LOCATION

The Hylebos Marsh property is located between the Hylebos Waterway and the Blair Waterway within the Tacoma Tide Flats, immediately to the northeast of Tacoma, Washington (Figure 1), bounded by Alexander Ave. to the south and Taylor Way to the north.

Figure 1. General survey area at the Hylebos Marsh property (red outline).

Figure 2. Geophysical survey area of interest highlighted in orange

Figure 3. Geophysical survey coverage for GPR (Red) and EM (Yellow) survey lines.

2.0 DESCRIPTION OF GEOPHYSICAL METHODS

2.1 ELECTROMAGNETIC INDUCTION

EM field data is typically collected using portable ground conductivity instrumentation. A transmitting coil induces an electromagnetic field, and a receiving coil at a (usually) fixed separation measures the amplitudes of the in-phase and quadrature components of the electromagnetic field. Various instruments have different coil spacing's and operating frequencies. Spacing and frequency affect depth of signal penetration. Both single frequency and multi-frequency instruments have been developed for commercial use.

The recorded EM field is separable into two sub-components; in-phase and conductivity (also referred to as quadrature). The in-phase (or magnetic susceptibility) component is most sensitive to metallic objects and is measured in parts per million (ppm). The quadrature component is sensitive to soil condition variations and is also measured – for the GEM-2 instrument – in parts per million (ppm).

The EM method was chosen due to the capability of mapping changes in soil conductivity that are caused by changes in soil moisture, disruption, or other conductivity changes caused by physical property contrasts, the ability to detect metallic objects (both ferrous and non-ferrous), and due to the relatively rapid rate of data acquisition.

The transmitting coil frequency and electrical conductivity of the host material primarily determine the depth of investigation for EM techniques. Referred to as skin depth in the literature (Telford *et al.*, 1990), it generally describes the decay of the EM field through a conductive medium. Formally, the skin depth (δ) is defined as the distance through which the field decays to e^{-1} (~37%) of its original amplitude:

Skin Depth: $$\delta = \sqrt{\frac{2}{(\pi f)\mu\sigma}}$$

Where:

σ = electrical conductivity of the host material

μ = magnetic permeability

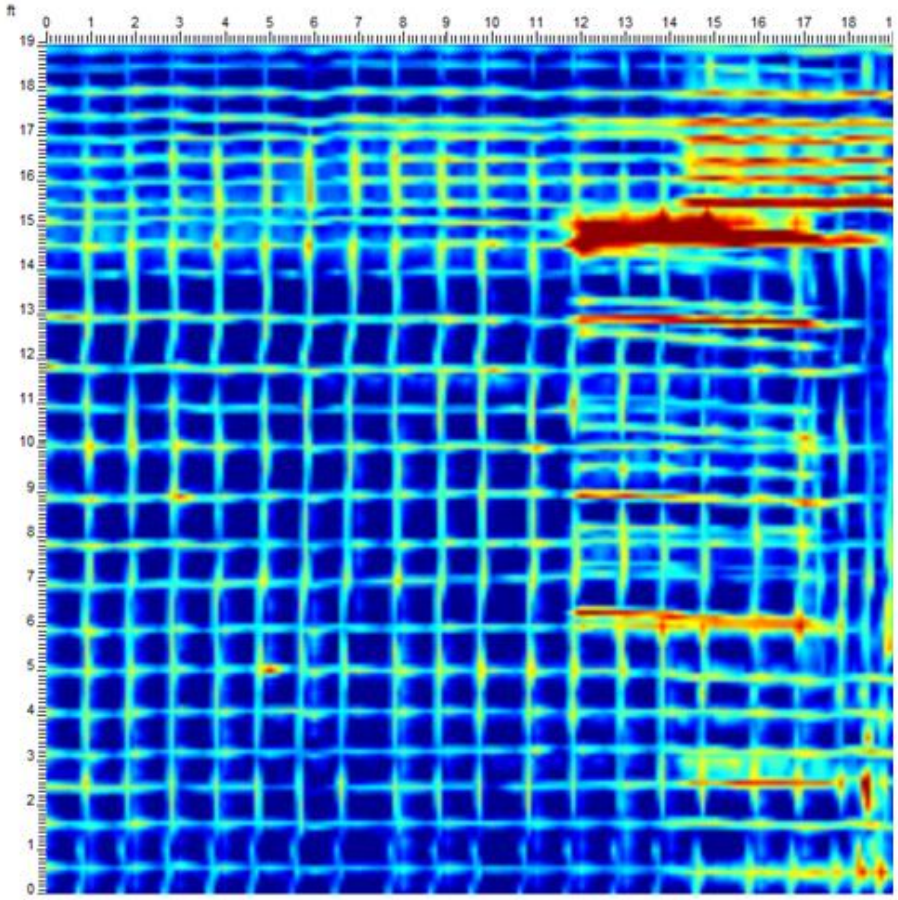
f = operating frequency of the instrument

There are several advantages of using a broadband, multi-frequency EM sensor. Since conductivity and permeability of the host material cannot be manipulated, the skin depth can be changed by changing frequencies. In theory, scanning through a frequency window is equivalent to depth soundings, where the results from multiple frequencies can be presented to understand the layering of earth materials.

2.2 GROUND PENETRATING RADAR (GPR)

GPR uses high-frequency radio waves, typically in the range 10 MHz to 2,000 MHz, to image subsurface structures and features. A transmitter antennae emits electromagnetic energy into the subsurface. When this energy encounters a buried object or an interface between materials having different permittivities, part of the energy is reflected back to the surface. A receiving antennae records the variations in the return signal. The signals are plotted in real-time as distance versus travel time allowing an assessment of the results as the survey progresses. The two-dimensional (2D) profiles can be combined into a three-dimensional (3D) grid of data to assess structure and features in plan view as depth slices (Figure 4).

Figure 4. Example processed 3D GPR Grid collected over a reinforced concrete reservoir. X and Y view plotted at the target depth.



GPR responds to changes in electrical properties (dielectric permittivity and electrical conductivity) which are a function of soil and rock material and moisture content. Electrically conductive materials, for example clay rich sediments, will limit radar signal penetration and hence imaging depths. The dielectric permittivity is a dimensionless measure of a material's capacity to store a charge when an electric field is applied (Table 1). This constant is primarily controlled by the water content of a material. Differences in dielectric constants at interfaces cause reflections in the GPR data, the strength of the reflections is controlled by the contrast in the dielectric constants. Dielectric contrasts as small as one can produce reflections in GPR data.

Table 1. Dielectric constants for some common materials.

AIR	1
SNOW	1-2
PVC	3
ASPHALT	3-5
FRESHWATER ICE	4
CONCRETE	4-11 (5)
BEDROCK	
GRANITE	4-7
SANDSTONE	6
SHALE	5-15
LIMESTONE	4-8
BASALT	8-9
SOILS AND SEDIMENTS	4-30
FRESH AND SALTWATER	81

3.0 METHODOLOGY

3.1 SURVEY AREA AND LOGISTICS

Data collection consisted of a grid of EM measurements across an approximately 75 by 1,000 feet area of interest. This was followed up by six (6) GPR survey lines with a spacing of 10ft. Data acquisition was conducted from August 5th to 6th, 2024.

3.1.1 Demobilization and Decontamination

HGI personnel and equipment was demobilized from the project site on August 6th, 2024. Demobilization included a visual inspection for invasive snails on all HGI equipment and vehicles. The decontamination inspection insured no invasive snails were inadvertently transported from the survey site.

3.2 DATA ACQUISITION

3.2.1 EM

The GEM-2 electromagnetic instrument (Geophex Ltd, Raleigh, North Carolina) was used to provide EM data. The EM system is used to detect variations in subsurface soil moisture, soil conductivity, and the presence of subsurface infrastructure (utilities, pipes, tanks, etc.). The GEM-2 consists of a sensor housing (the "ski"), and the electronics console. The console includes the data acquisition, rechargeable battery, and data storage hardware. Data was collected on a grid over the survey area and georeferenced with an onboard GPS system, with an approximately 10 foot spacing between parallel survey lines.

3.2.2 Ground penetrating Radar

A Noggin SmartCart 250 system (Sensors and Software, Mississauga, Ontario, Canada) was used for the GPR survey. An antennae frequency of 250 MHz provided the optimum balance between a depth of investigation, of approximately 5 to 8 feet below grade, and maintaining high resolution over this depth. Data was collected on a grid over the survey area, with an approximately 10 foot spacing between parallel survey lines.

3.3 DATA PROCESSING

3.3.1 Quality Control – Onsite

Daily inspections were conducted to ensure all equipment was in satisfactory working condition. Quality assurance tests including a visual inspection and a functionality test were performed. Data were given a preliminary assessment for quality control (QC) in the field to assure quality of data before progressing the survey. Following onsite QC, the data were transferred to the HGI server for storage and detailed data processing and analysis. Raw data files were retained in an unaltered format as data editing and processing was initiated.

Daily notes on survey configuration, location, equipment used, environmental conditions, proximal infrastructure or other obstacles, and any other useful information were recorded during data acquisition and were saved to the HGI data server.

3.3.2 EM

EM data processing occurred in discrete steps within a master Microsoft Excel file, so that all data from a previous step could be recovered or viewed. WinGEM (Geophex Ltd, Raleigh, North Carolina) was used to process EM data. The process included the following steps:

1. Removing data spikes from the individual data files, using Microsoft Excel.
2. Visualization of results using Surfer mapping software (Golden Software, Inc.).

3.3.3 Ground Penetrating Radar processing

Data processing for the GPR used the Ekko Project (Sensors and Software, Mississauga, Ontario, Canada) GPR processing software. Any geometry changes to correct for errors made during the field acquisition were conducted within the headers for each profile. The GPR data were converted from travel time into depth by using the hyperbola velocity calibration function within Ekko Project. A number of diffraction hyperbola within the GPR profiles were curve fitted to provide an average estimate of the subsurface sediment velocity. This velocity was then used to convert the data to distance versus depth profiles.

Data processing steps required for all transects included: DEWOW filter, background removal, migration, and exponential gain function. The processed grid were exported from the SliceView Module of Ekko Project. Relevant features were plotted on the GPR grid to assist in data analysis.

4.0 RESULTS

The results of the EM survey are presented in Figures 5 through 9. EM data was collected at five different frequencies (1,530 Hz, 3,450 Hz 5,310 Hz, 18,330 Hz, and 63,030 Hz) for in-phase and quadrature readings. All frequencies were analyzed but we are only presenting the 5,310Hz frequency response converted to ground conductivity in milliSeimens per meter (mS/m) and magnetic susceptibility. Ground conductivity values at frequencies 1,530 Hz, 5,310 Hz, and 18,830 Hz are also presented to compare changes in soil conductivity over depth (Figures 7 through 9). The magnetic susceptibility data is the strongest and simplest indicator for buried auto fluff and is heavily relied on to draw conclusions on the extent of the buried auto fluff.

In both EM methods, the data generally shows a relatively homogeneous background, on which we observe several large amplitude responses. These responses are present in both the ground conductivity and magnetic susceptibility data and are predominately contained to the mid-section of the survey area, along the eastern boundary. These features have been circled in Figures 6 and 7 and are likely responses to surficial or subsurface metallic debris associated with the landfill at the site. All of these large amplitude responses are observed within the expected area of auto fluff highlighted in orange in Figure 2. This region also corresponds to the elevated and undulating hillslope which runs along the eastern chain link fence of the property. Additionally, no large responses were observed along the flat lowland western portion of the survey area, suggesting the extent of and depth of the soil-capped landfill may be contained to the hillslope.

We observed a number of high amplitude smaller isolated responses, these have been highlighted by the yellow crosses in Figures 5 through 9 as more likely associated with surface features as opposed to subsurface responses. These locations correlate with monitoring well heads, surface debris, chain link fences and the transformer substation. In all EM surveys we observe an increased response adjacent to the electrical transformer substation along the southern boundary of the survey. This interference with the EM equipment is expected and is not related to subsurface debris or auto fluff (labeled A, in Figures 6 and 7).

Outside of high response areas the ground conductivity displays an average background of between 50 and 300 mS/m, although with all the high amplitude responses to the metallic infrastructure and likely disturbed nature of the site it is difficult to ascertain the true background values of the natural soils.

Response “A” (Figures 6 and 7) can be directly attributed to surface inference caused by data collection in close proximity to the transformer substation and chain link fence adjacent to the eastern property boundary. Likewise, any responses directly adjacent to the property boundary chain link fence can be regarded as surface noise. In this situation, GPR is used to supplement

data collection in these areas. Likewise, responses "B" and "C" can be attributed to a nearby surface object in this case a metal drum debris and monitoring well casing SB-3A.

Responses labeled "D" contain the majority of the suspected auto fluff and buried metal debris extent at the site. Anomalous increases and decreases in magnetic susceptibility provide a good indication of buried metal debris. The responses are located throughout the hillslope, from the top to the base of the hill slope, which runs along the eastern boundary of the survey area. The terrain of this area is predominately undulating with steep mounds and depressions along the hillside, suggesting anthropomorphic earthwork, potentially related to the historical landfill usage.

Response "E' is associated with monitoring well casing TWA-5 and surrounding surface indications of auto fluff. Recent soil borings just north of the response E area confirmed auto fluff contamination from the near surface to 5.6 feet below ground surface. TWA-5 well casing is a contributing factor in the response E area, however, adjacent soil boring results and surface observations indicate auto fluff is also responsible for the elevated response in this area. Additionally, an approximately 130 by 65 feet area labeled "F", has a slightly above background magnetic susceptibility with an average of 3000 ppm. In this area, we observe a large amount of small (1in - <1in) plastic and metal fragments (auto fluff) on the surface, likely causing the elevated magnetic susceptibility in this zone. Furthermore, only at the highest frequency (the shallowest imaging depth) of the soil conductivity readings do we observe a meaningful increase in conductivity values. This suggests that the surface debris material is possibly auto fluff eroding onto the surface from the adjacent hill side and does not correlate with extensive subsurface auto fluff in this zone.

Both response locations at "G" have a clear correlation, between the magnetic susceptibility and soil conductivity data. These responses are relatively small compared to the extensive mid-section "D" features, and may more likely be isolated buried debris.

Interestingly, when comparing ground conductivity values for each frequency, 1,530 Hz, 5,310 Hz, and 18,830 Hz we observe changes in soil conditions with increasing depth and spatial variations within the background (Figures 7, 8, and 9). In general, higher frequencies correspond to shallower imaging depth and vice versa. At the highest frequency presented, 18,830 Hz, ground conductivity values are higher throughout the survey area in comparison to the lower imaging depth frequencies. The general reduction in conductivity with depth is likely associated with higher moisture at the near surface. Field observations indicate areas with noticeably wetter soils in drainages and depressions correspond with slightly elevated conductivity values in the light brown / tan in the shallow frequencies, 18,830 Hz, and 5,310 Hz, and are noticeably absent at the deeper imaging depths. Furthermore, the most distinctive conductive zone highlighted in blue and green at the upper midsection of the 18,830 Hz and 5,310 Hz plots is associated with scattered surface debris fragments and is clearly more apparent in shallow imagining, supporting the

conclusion that EM responses in this area may be the result of eroded auto fluff debris at the near surface and artificial responses to various surface objects, not extensive buried auto fluff.

The GPR results are presented as a series of map view figures at different depth intervals taken through the survey grid. Depth slices a presented from 0.328 to 5.095 feet below ground surface. The contoured results represent high amplitudes as warmer colors (green to red shades) and low amplitudes as cooler colors (purple to blue shades). Higher magnitude responses may be related to surficial objects, buried objects, or disturbed soils. The objective of the GPR survey is to supplement the EM data collection along zones where the EM data collection is susceptible to surface interference and provide additional data resolution to target buried auto fluff material. Throughout the survey area, we observe correlated responses between the GPR and EM data. Circled zones of elevated magnetic susceptibility are plotted on Figures 10 through 18 for comparison of the survey data.

Throughout the survey area we observe a few instances of significant data responses related to surficial material interfering with the GPR data collection. Instances of data features not corresponding to subsurface conditions due to surface material interference are labeled "(1)" in all GPR figures. Within the south westernmost zone "(1)" we observe a distinct red/brown colored response most apparent at depths below 1.64ft (Figures 14 and 15). This feature can be attributed to a metallic surface object creating ringing in the data in this area. This zone is located in undulating and densely vegetated terrain, where a near surface object may not be visually detectable onsite. The next "(1)" labeled section to the of can be attributed to interference due to monitoring well head casing SB-3A, although we observe a much more muted response in this location. Along the eastern boundary of the property, near the midsection of the survey area, we again observe a distinct response feature "(1)". This feature is likely the result of metal rebar bars buried in a line along the chain link fence at this location, interfering with GPR data quality at depth. Lastly, the northernmost type "(1)" response feature is associated with the monitoring well head casing TWA-5, and surrounding metallic fragments. Here we observe more noticeable interface at all depths compared to the area surrounding monitoring well head SB-3A.

Zone "(2)" consists of an approximate 40by 100 feet area at the northeastern portion of the survey area with an elevated response compared to the background. At this zone we observed the lowest section of the survey area and noted depressions and drainages with wetter soil in this location. Wetter soil conditions and changes in soil composition in this are most likely responsible for elevated readings in this area.

Zone "(3)" corresponds well with suggested auto fluff contaminated areas determined with the EM data. In this area we observe a moderate response distinct from the background throughout all depths. The strongest response is highlighted in red and brown above the survey line break, between depths 4.921 to 5.249 feet (Figure 17). The GPR data from this section furthermore indicates the potential for buried material and/or auto fluff in the area.

Figure 5. EM magnetic susceptibility (In-Phase) results for 5,310 Hz measurements.

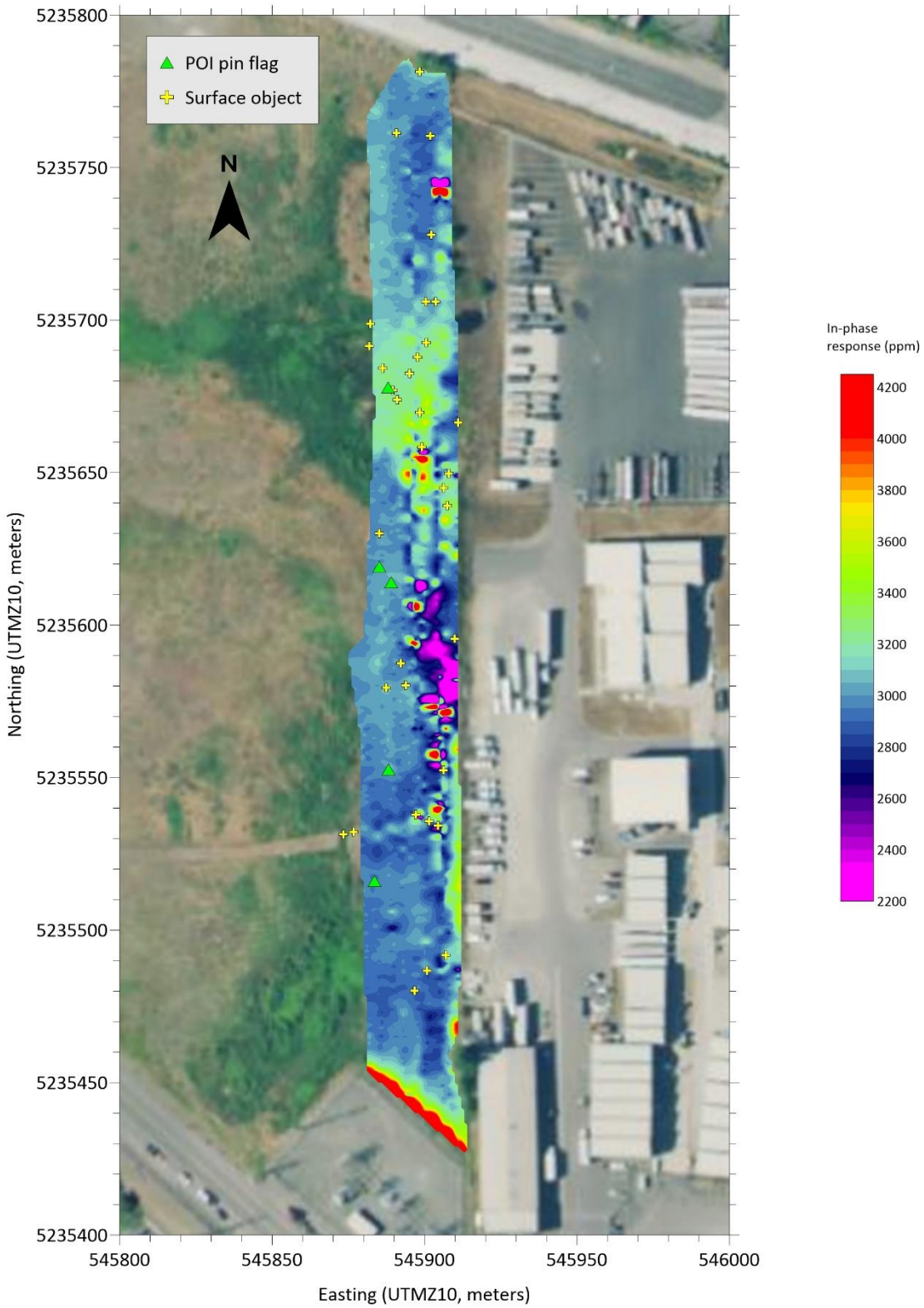


Figure 6. EM magnetic susceptibility results for 5,310 Hz measurements, responses circled and labeled.

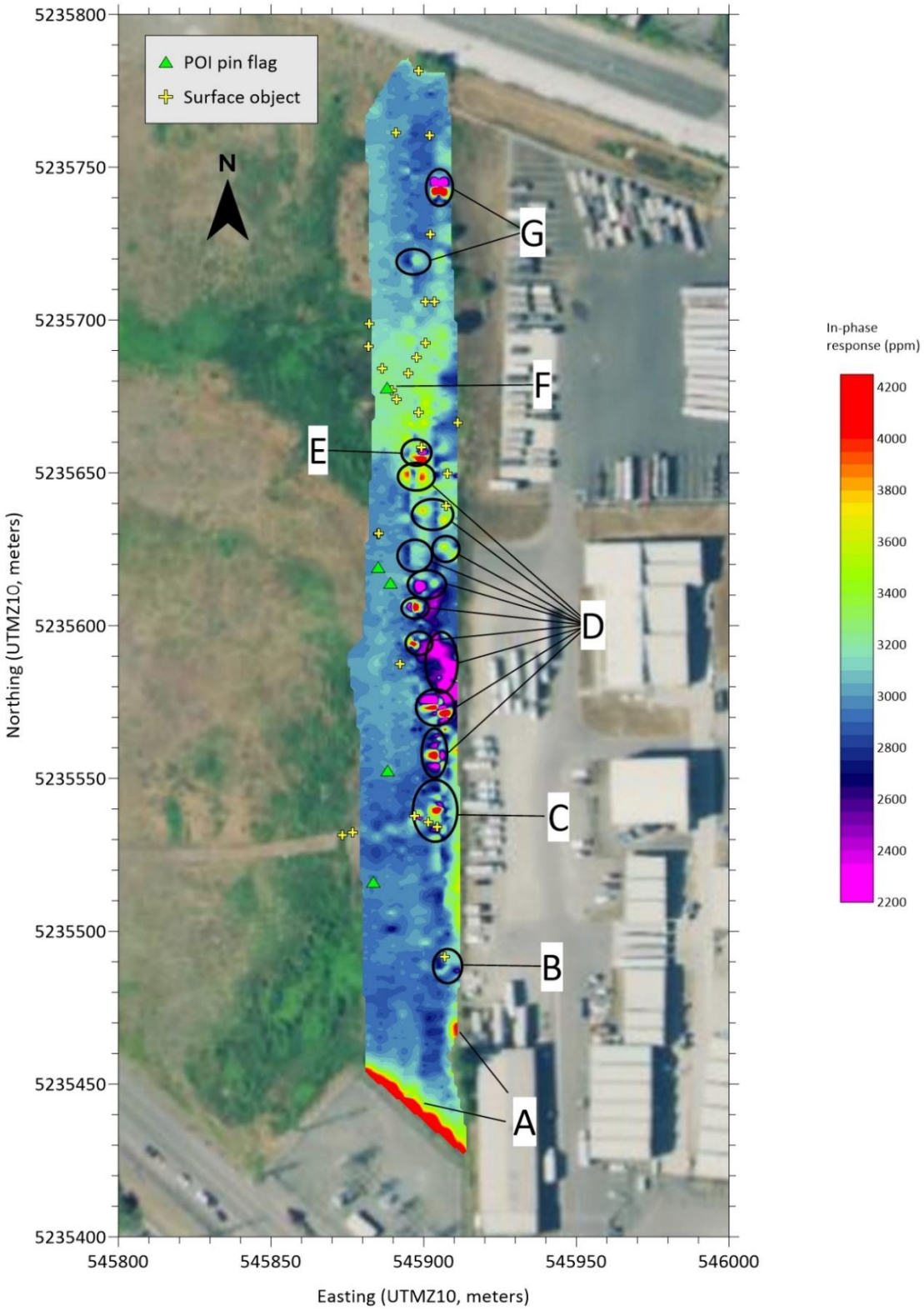


Figure 7. EM Ground Conductivity survey results for 1,530 Hz measurements, in-phase responses circled.

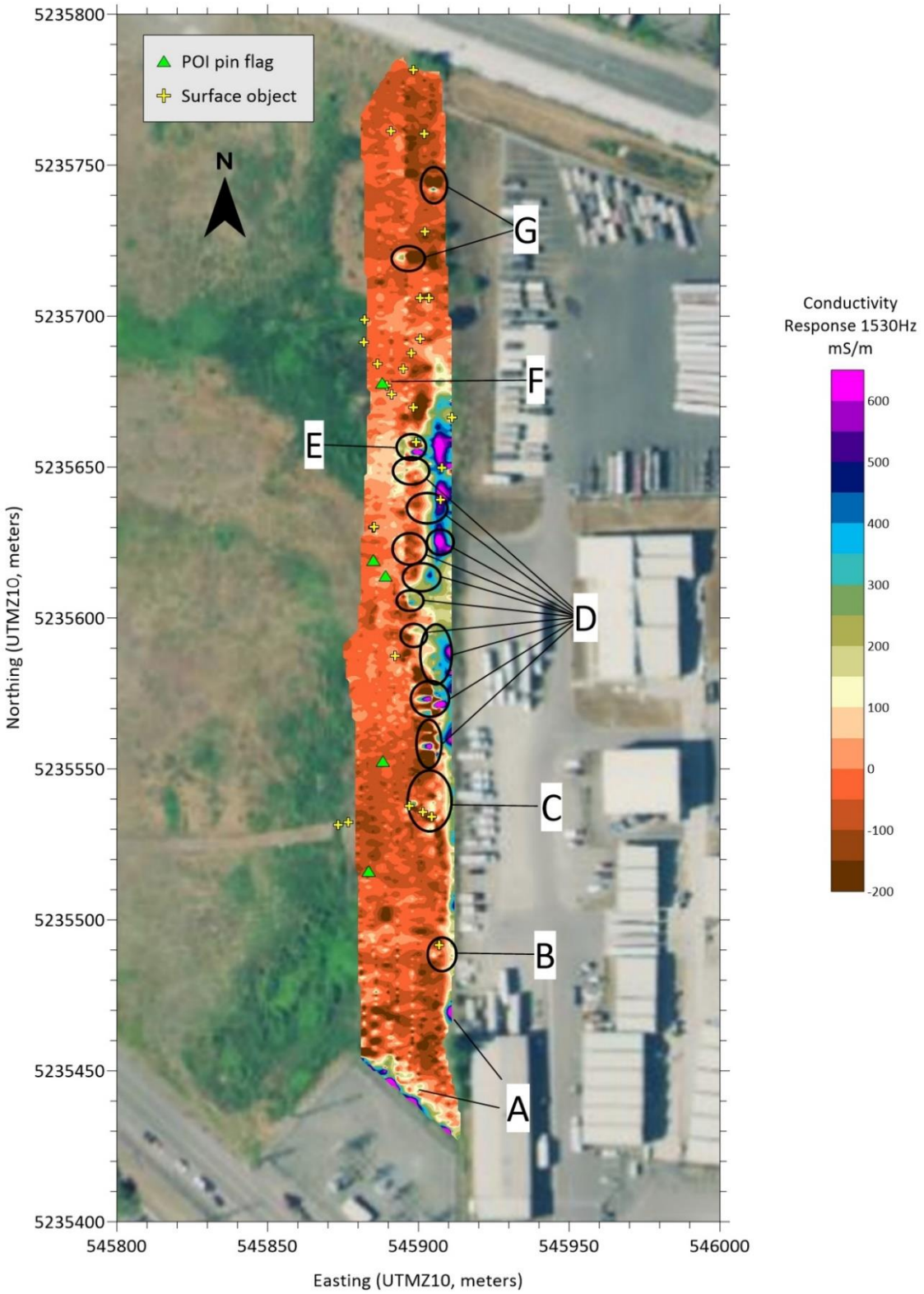


Figure 8. EM Ground Conductivity survey results for 5,310 Hz measurements.

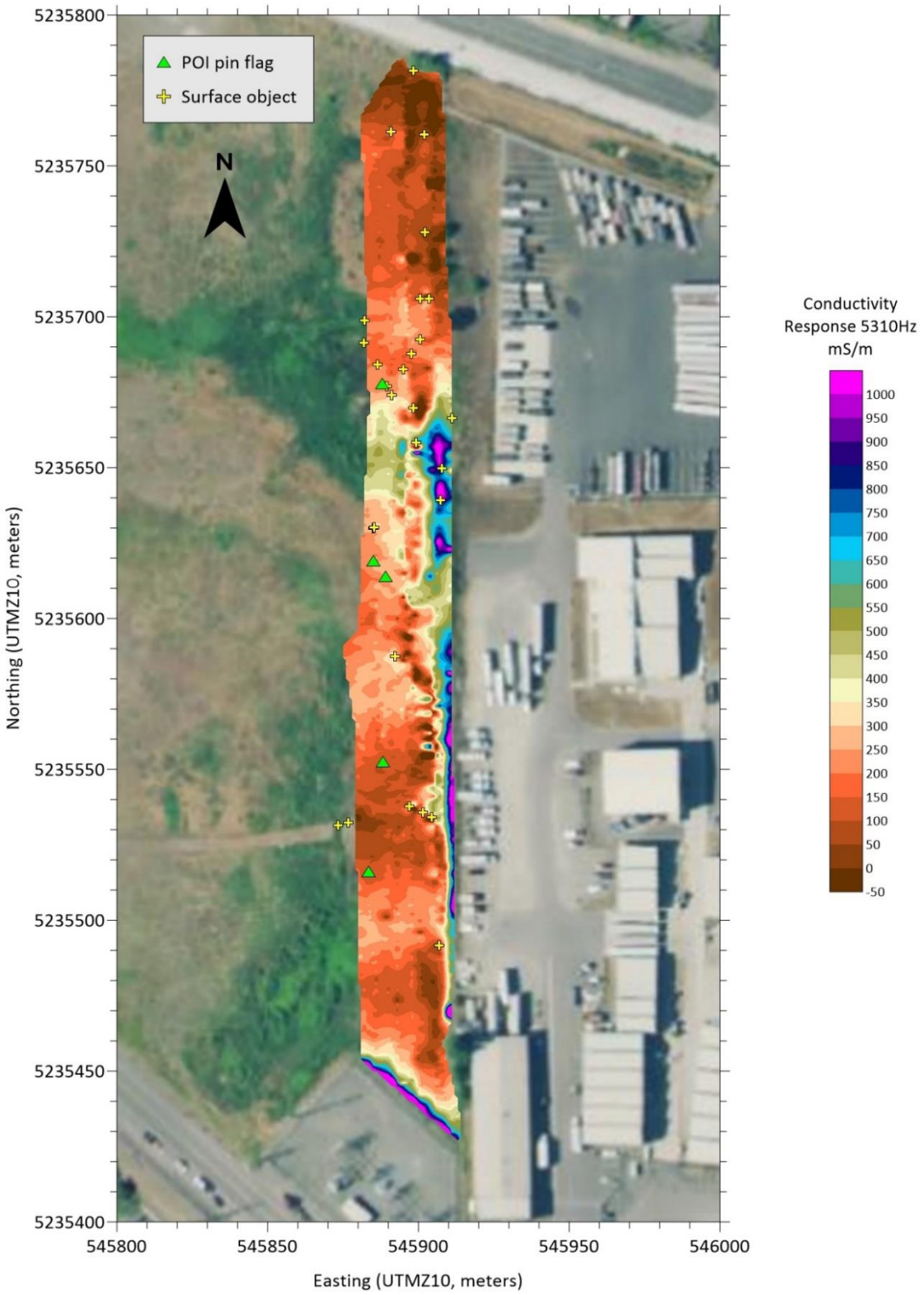


Figure 9. EM Ground Conductivity survey results for 18,330 Hz measurements.

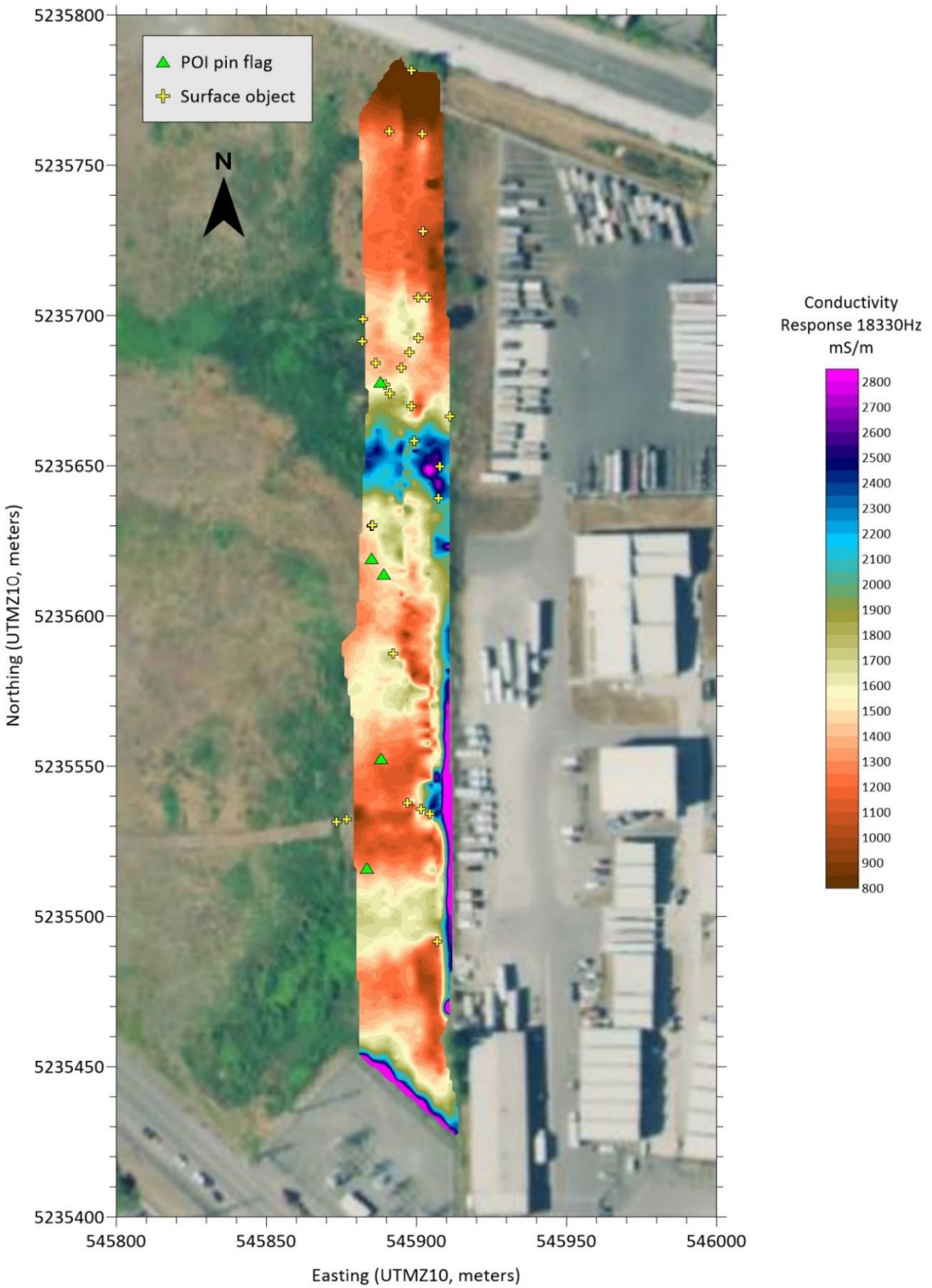


Figure 10. GPR depth slice, 0.328 to 0.656 feet, with EM anomalies overlaid.

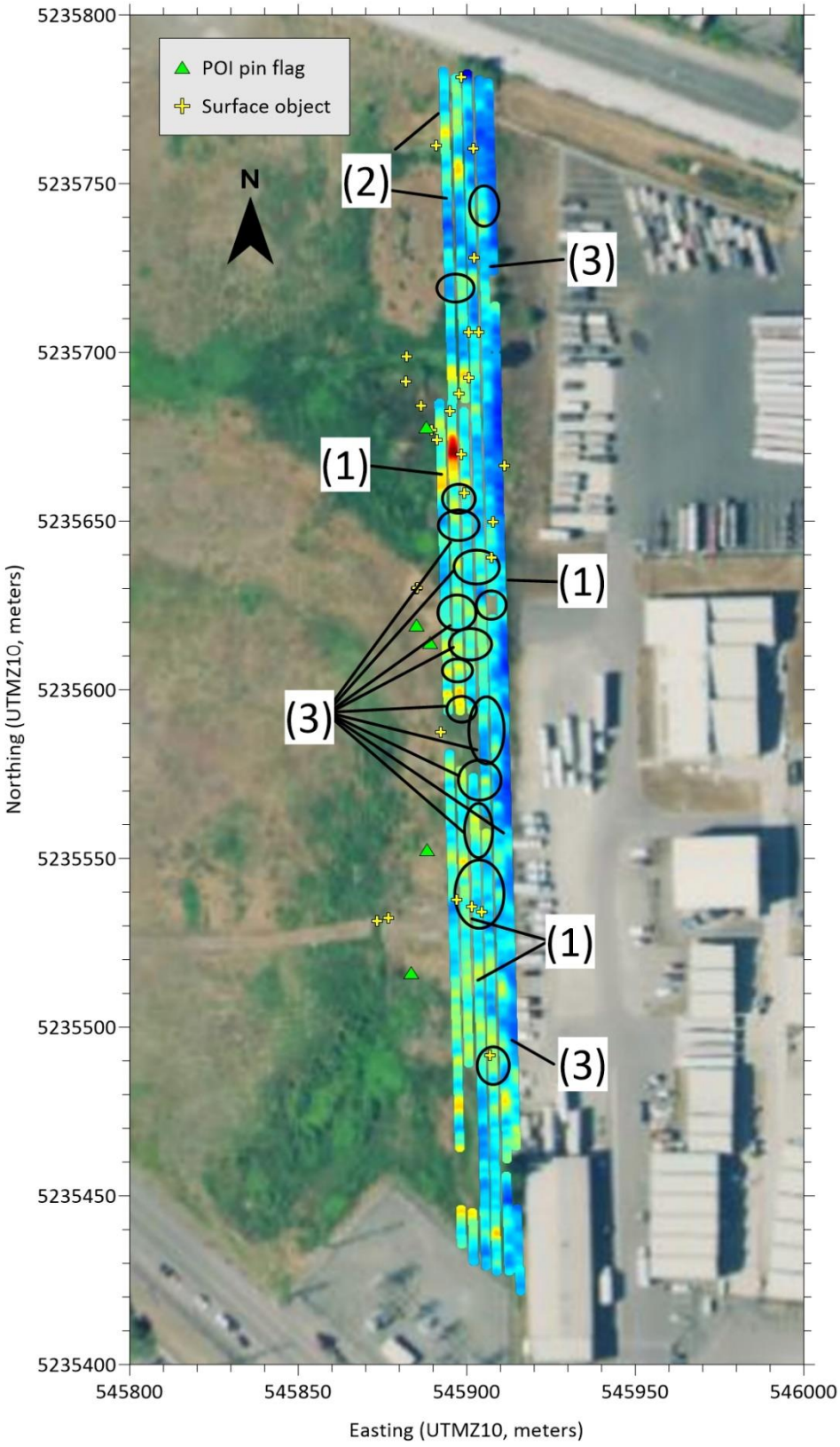


Figure 11. GPR depth slice, 0.984 to 1.312 feet, with EM anomalies overlaid.

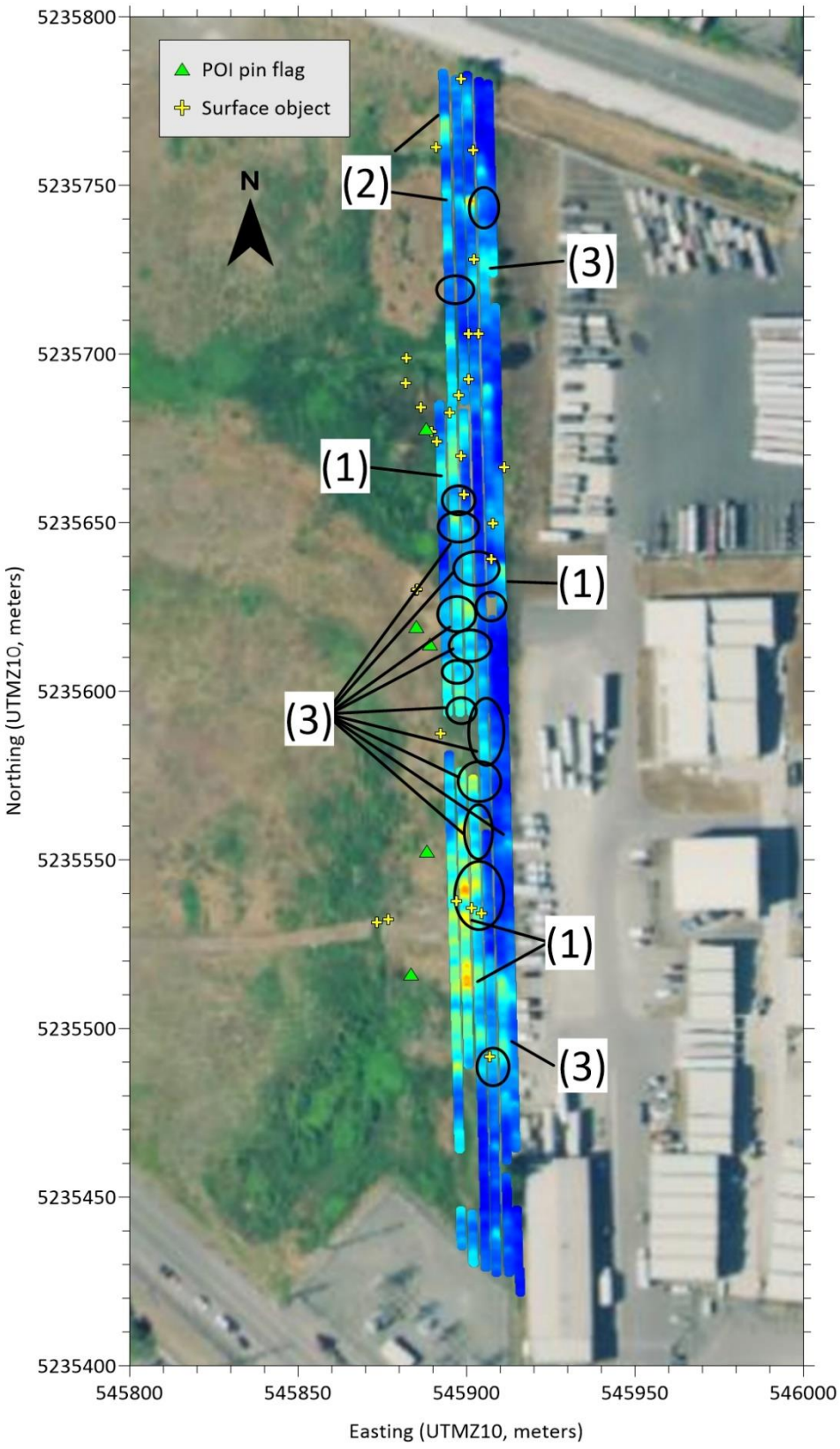


Figure 12. GPR depth slice, 1.640 to 1.968 feet, with EM anomalies overlaid.

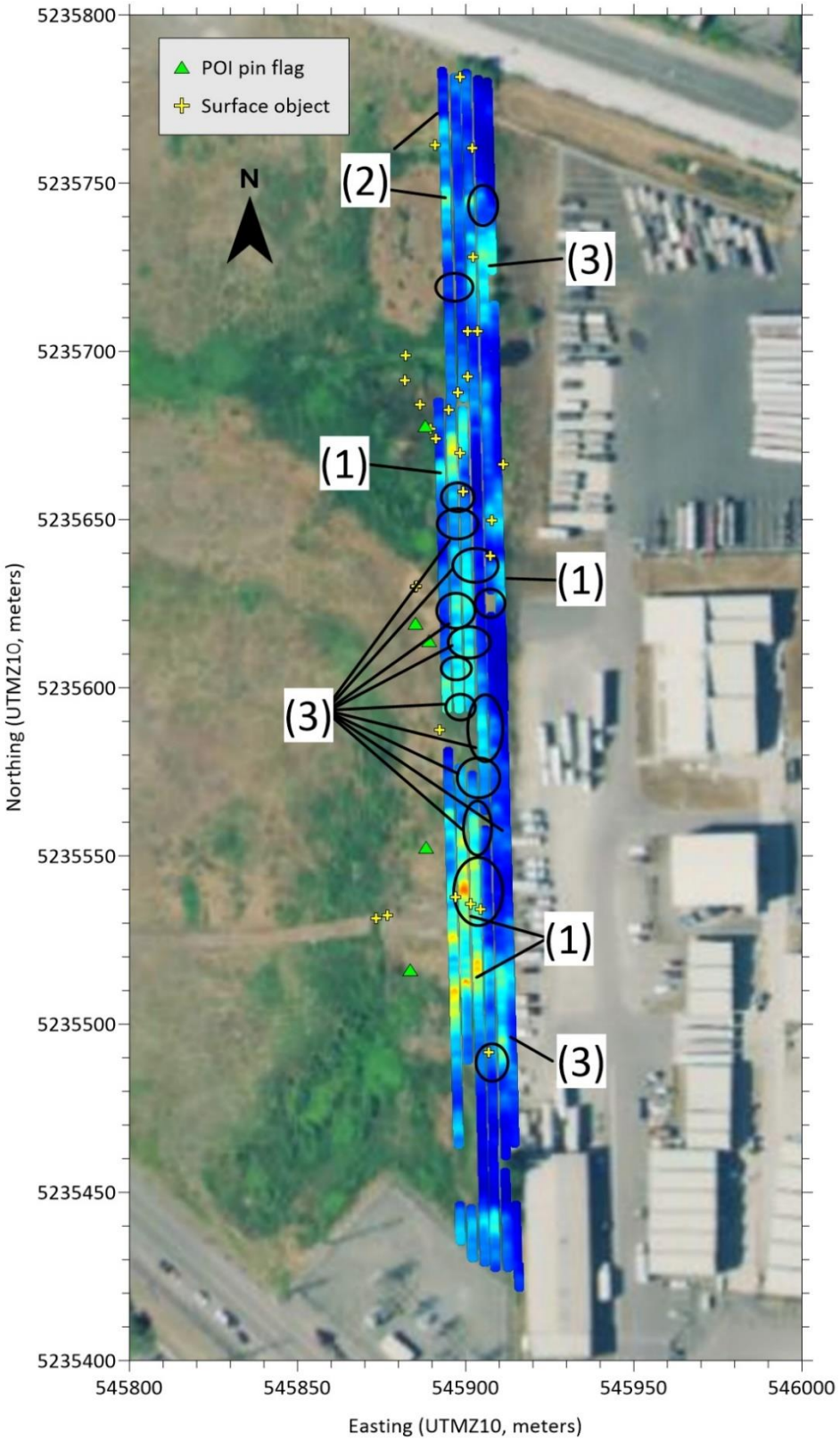


Figure 13. GPR depth slice, 2.296 to 2.624 feet, with EM anomalies overlaid.

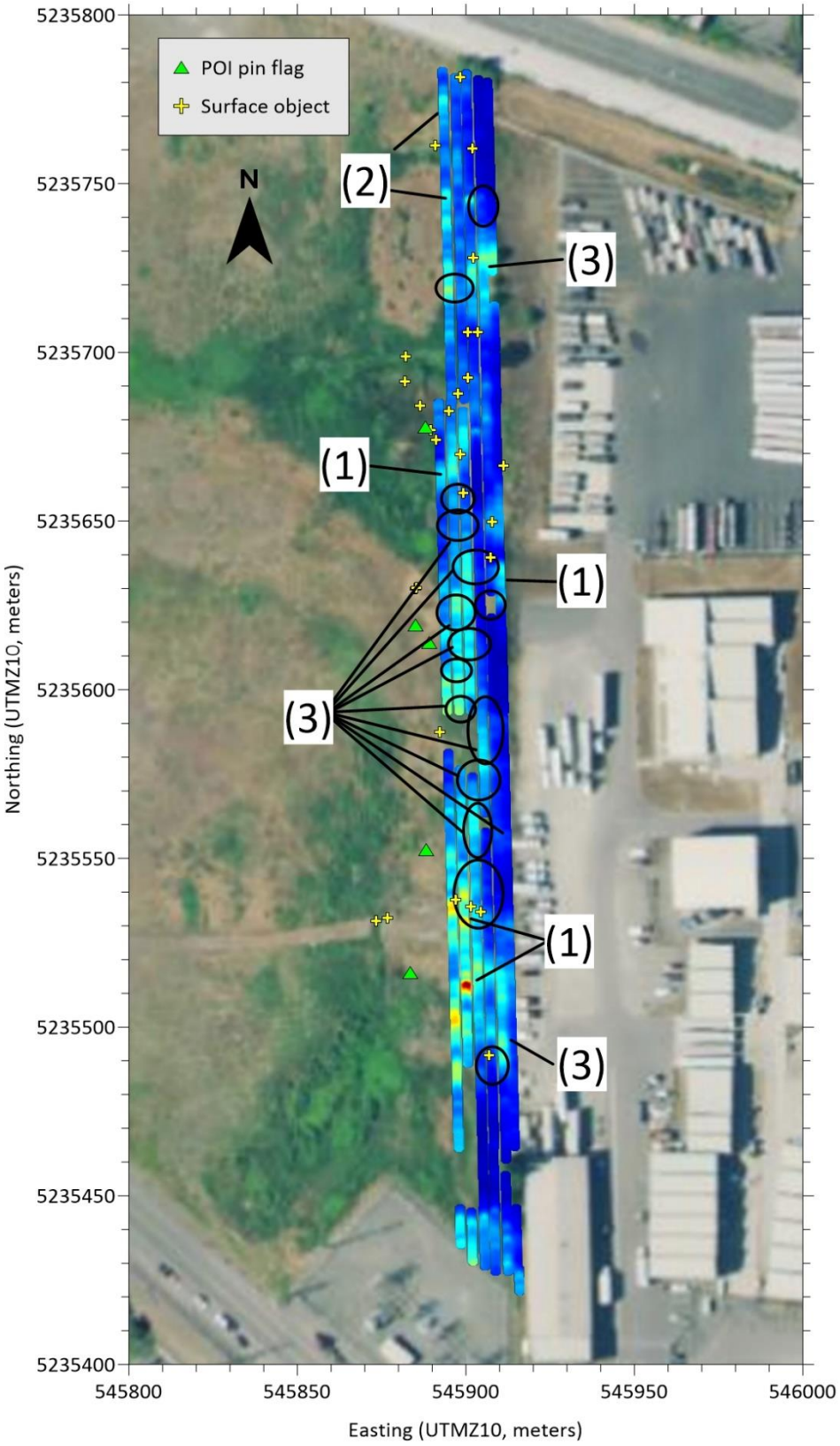


Figure 14. GPR depth slice, 2.952 to 3.280 feet, with EM anomalies overlaid.

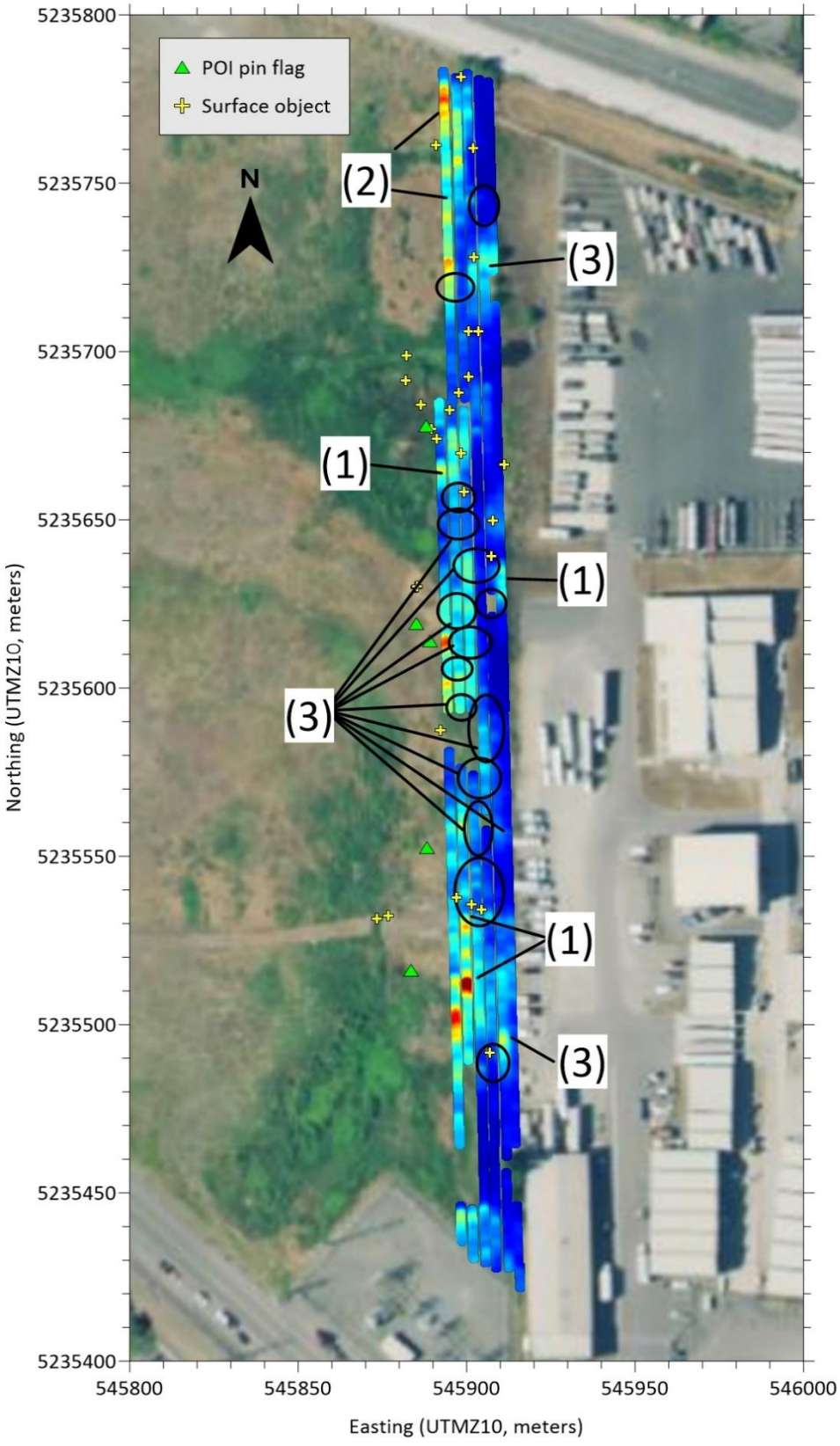


Figure 15. GPR depth slice, 3.608 to 3.937 feet, with EM anomalies overlaid.

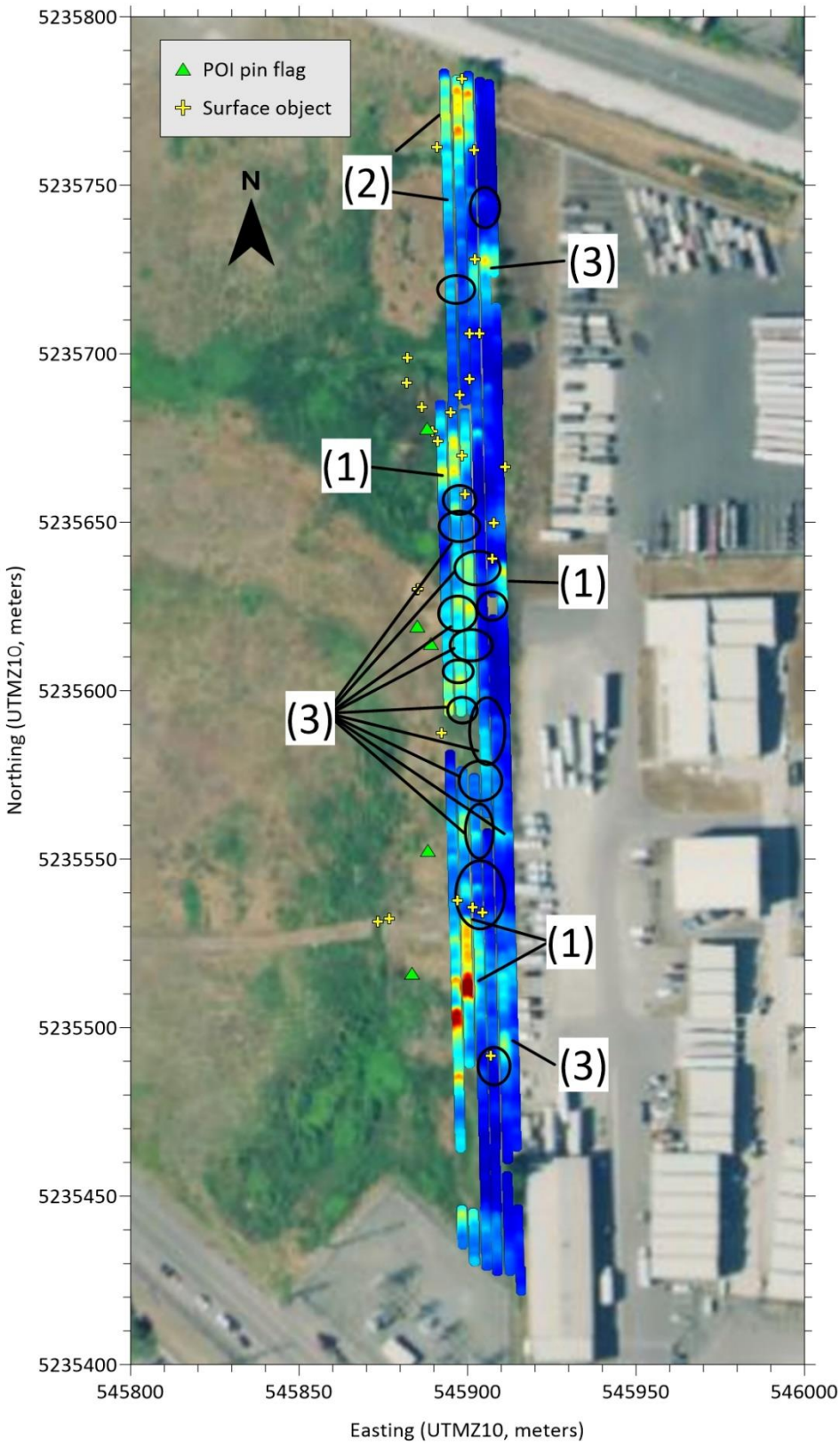


Figure 16. GPR depth slice, 4.265 to 4.593 feet, with EM anomalies overlaid.

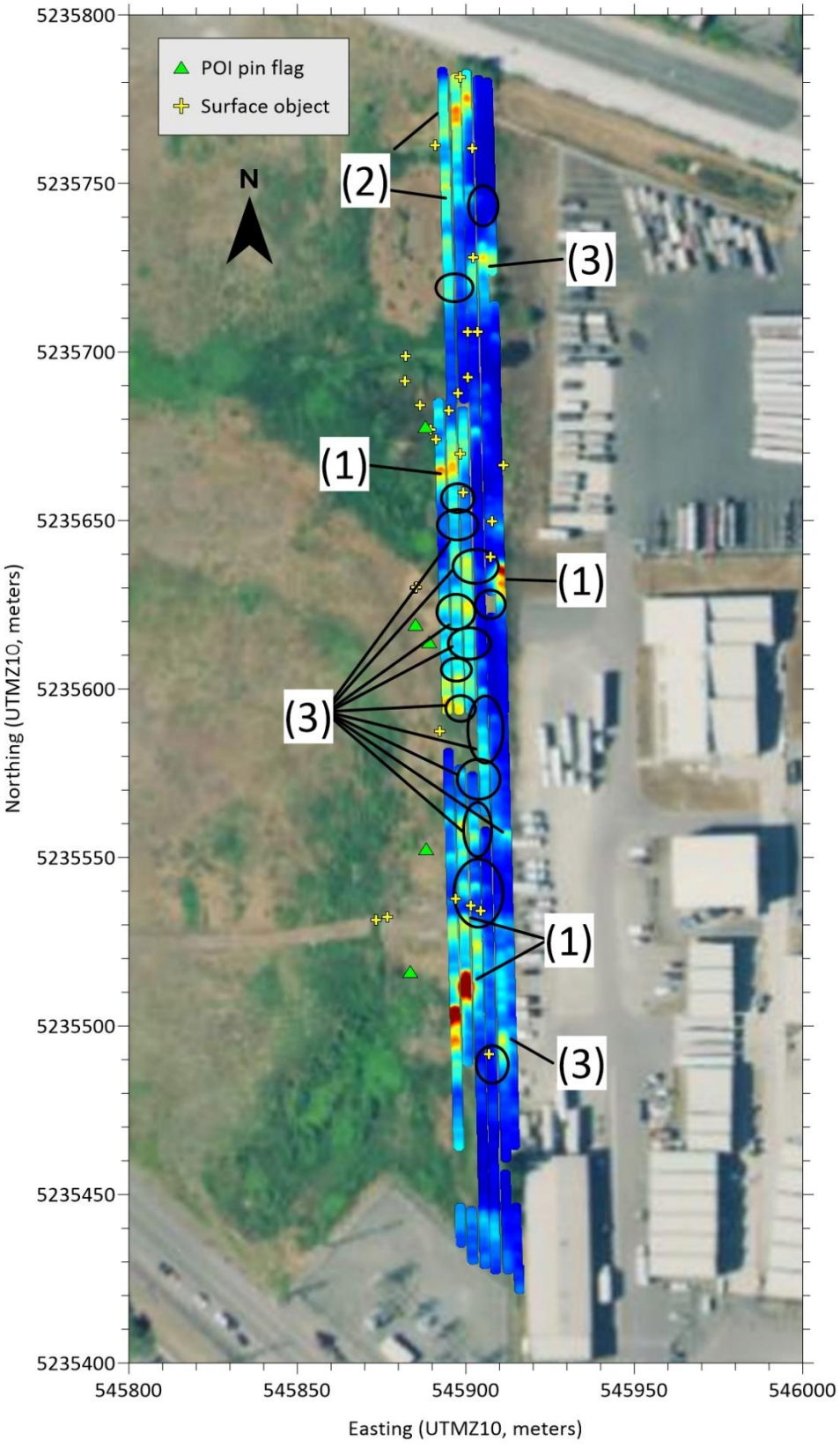


Figure 17. GPR depth slice, 4.921 to 5.249 feet, with EM anomalies overlaid.

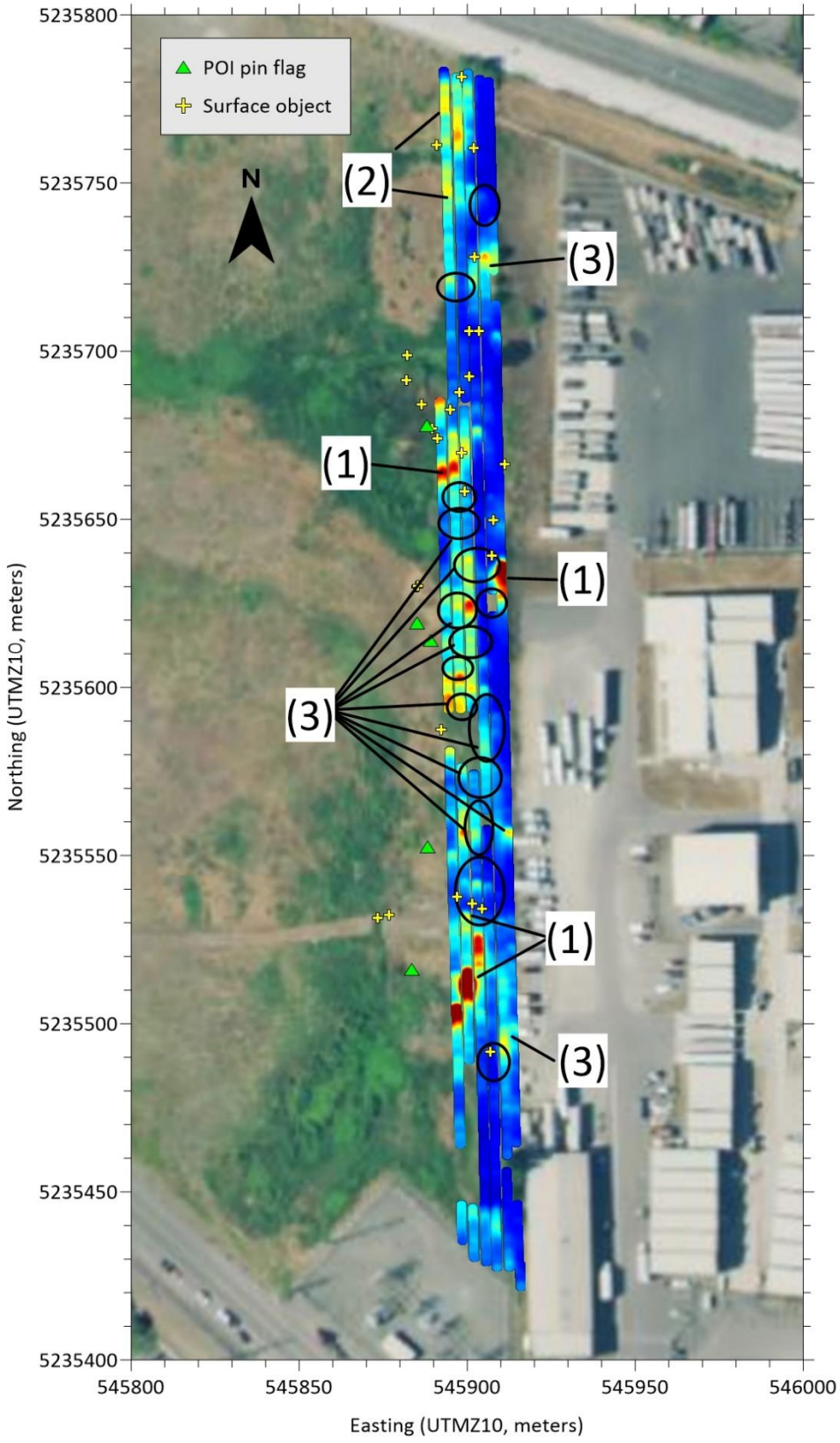
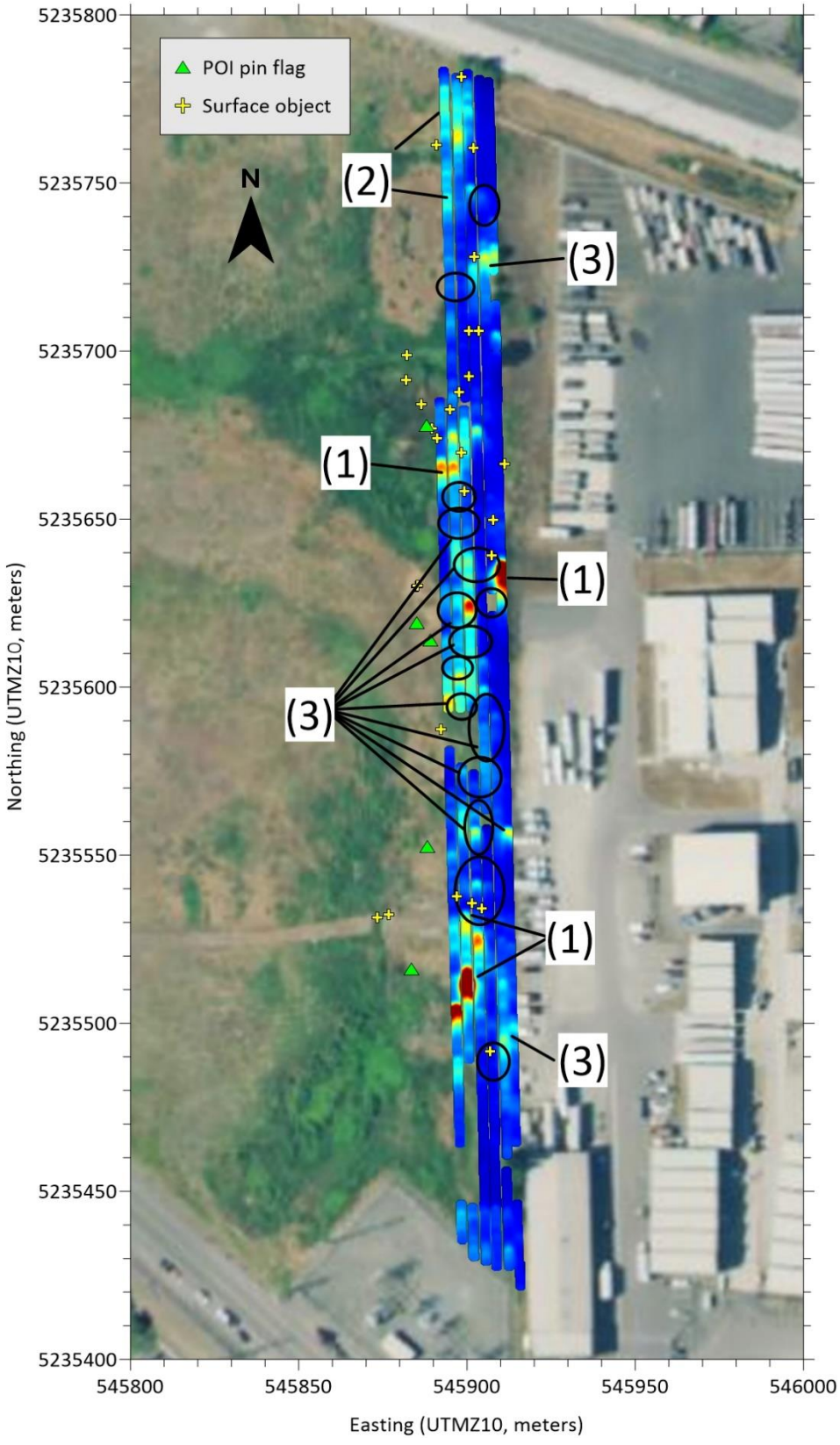


Figure 18. GPR depth slice, 5.577 to 5.905 feet, with EM anomalies overlaid.



5.0 SUMMARY

A geophysical survey, that included electromagnetic induction (EM) and ground penetrating radar, was conducted at the Hylebos Marsh property at the Port of Tacoma, Washington. The primary objective of the geophysical characterization was to identify and delineate the extent of buried auto fluff and various debris related to former land usage as an unmonitored landfill.

The EM results highlighted several areas with a high likelihood of containing buried auto fluff or other metallic debris. The EM responses displayed high amplitude ground conductivity and high/low anomalies in the magnetic susceptibility values, which are likely responses to surficial or subsurface metallic objects. These response zones tended to be concentrated on the eastern midsection of the survey area, generally extending from the top of the hillslope to the base. Outside of this area the EM results generally displayed low background readings consistent with natural soil on the site, with occasional high amplitude responses interpreted to be unrelated to subsurface auto fluff. The supplemental ground penetrating radar survey targeted areas expected to have diminished EM data due to surface interference, such as the electrical transformer substation to the south, the eastern boundary fence, and monitoring well heads. The results of the GPR survey correlated well with the EM data and further supported interpretations of buried auto fluff along the mid-section of the survey area.

Various surficial metallic objects impacted both EM and GPR data collection throughout the survey area, this caused multiple artificial responses in the data not related to the subsurface conditions. However, these surface interference sources were minimal in spatial extent and did not greatly impact the overall interpretations. We have summarized the interpreted location of the expected highest concentration of buried metallic and auto fluff debris extent, outlined in red in Figure 19.

Figure 19. Summarized interpreted extent of auto fluff based on geophysical responses (red outline).

6.0 REFERENCES

Telford, W. M., Geldart, L. P., and Sherriff, R. E., 1990. Applied Geophysics (2nd Edition): Cambridge University Press.

Attachment C

Field Sampling Data Sheets

MAUL FOSTER ALONGI

MAUL FOSTER ALONGI

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Soil Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	TWA-HA-01				
Project Number	M0615.20.014	**Sampler**	J. Hansen				
Project Name	Hylebos Marsh Subsurface Investigation	**Sampling Date**	08/05/2024				
Sampling Event	August 2024	**Sample Name**					
Sub Area		**Sample Depth (ft)**					
FSDS QA:	F. Bellows 09/30/2024	**Easting**		**Northing**		**TOC**	

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(2) Hand Auger	Soil			10:35:00 AM	2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

0 to 12 inches bgs: SILT (ML); brown; 100% fines; trace vegetation. Becomes reddish-brown with trace woodwaste @ 6 inches.
12 to 18 inches bgs: SILT (ML); brown to reddish-brown; 80% fines; 20% woodwaste.
18 to 24 inches bgs: WOODWASTE; brown; 25% fines; 75% woodwaste.

General Sampling Comments

0 to 24 inches: Hand auger encountered hard plastic at 6 inches. Significant woodwaste observed at depth.

No auto fluff encountered. No samples collected.
bgs = below ground surface.

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature _____

MAUL FOSTER ALONGI

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Soil Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	TWA-HA-02
Project Number	M0615.20.014	**Sampler**	J. Hansen
Project Name	Hylebos Marsh Subsurface Investigation	**Sampling Date**	08/05/2024
Sampling Event	August 2024	**Sample Name**	
Sub Area		**Sample Depth (ft)**	
FSDS QA:	F. Bellows 09/30/2024	**Easting**	**Northing**	**TOC**

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(2) Hand Auger	Soil			10:15:00 AM	2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

0 to 18 inches bgs: SAND (SP); gray; 90% sand; 10% gravel, rounded; trace roots; loose.
18 to 24 inches bgs: SILTY SAND (SM); gray; 30% fines; 60% sand; 10% gravel, rounded.

General Sampling Comments

0 to 18 inches bgs: Collected with hand trowel.
18 to 24 inches bgs: Collected with hand auger.

No auto fluff encountered. No samples collected.
bgs = below ground surface.

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature _____

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Soil Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	TWA-HA-03				
Project Number	M0615.20.014	**Sampler**	J. Hansen				
Project Name	Hylebos Marsh Subsurface Investigation	**Sampling Date**	08/05/2024				
Sampling Event	August 2024	**Sample Name**					
Sub Area		**Sample Depth (ft)**					
FSDS QA:	F. Bellows 09/30/2024	**Easting**		**Northing**		**TOC**	

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(2) Hand Auger	Soil			9:45:00 AM	2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

0 to 12 inches bgs: SAND (SP); gray; 100% sand; trace roots; loose.
12 to 18 inches bgs: SAND with SILT (SP-SM); gray; 10% fines; 90% sand.
18 to 24 inches bgs: SILTY SAND (SM); gray; 30% fines; 70% sand.

General Sampling Comments

0 to 24 inches bgs: Collected with hand auger.

No auto fluff encountered. No samples collected.
bgs = below ground surface.

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature _____

Attachment D

Boring Logs

MAUL FOSTER ALONGI

Geologic Borehole Log

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Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-09	1 of 1

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/12/2024 to 8/12/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	15.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				0		0.0 to 0.7 feet: GRAVELLY SAND (SP); tan; 60% sand, fine to medium; 40% gravel, medium, rounded; loose; no odor; dry.
						0.7 to 1.3 feet: GRAVELLY SAND WITH SILT (SP-SM); gray; 10% fines, nonplastic; 70% sand, medium; 20% gravel; loose; no odor; moist.
2				0		1.3 to 3.0 feet: WOODY DEBRIS; brown; 100% organic material (wood chips and fibers); medium; slight organic-like odor; moist.
3		60				
						3.0 to 5.0 feet: NO RECOVERY.
4						
5						
						5.0 to 6.7 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; moist.
6				0		
	▽		TWA-SB-09-S-6.0			@ 6.4 to 6.7 feet: roots up to 0.5" in diameter.
7						@ 6.5 feet: becomes wet.
						6.7 to 7.3 feet: SILT WITH SAND (ML); gray; 80% fines, medium plasticity; 20% sand, fine; soft; no odor; wet.
		66		0		7.3 to 8.3 feet: ORGANICS WITH SILT; brownish-gray; 20% fines, nonplastic; 80% organic material (peat and rootlets); medium dense; slight sulfur-like odor; moist.
8						
9						8.3 to 10.0 feet: NO RECOVERY.
10						
						10.0 to 11.9 feet: SILT WITH SAND (ML); gray; 80% fines, medium plasticity; 20% sand, fine; soft; no odor; trace roots; wet.
11				3		
12						11.9 to 13.9 feet: ORGANICS WITH SILT; brownish-gray; 40% fines, medium plasticity; 60% organic material (peat and rootlets); organic-like odor; wet.
		78				
13				0		
14						13.9 to 15.0 feet: NO RECOVERY.
15						

Total Depth = 15.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet: 2-inch-diameter borehole.
0.0 to 15.0 feet: Bentonite chips hydrated with potable water.

▽ **Soil becomes wet at approximately 6.5 feet as observed in the core liner at time of drilling.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONGI

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-10	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/12/2024 to 8/12/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				0		0.0 to 0.9 feet: SANDY GRAVEL (GW); tannish-gray; 35% sand, fine to coarse; 65% gravel, fine to coarse, subangular to rounded; loose; no odor; dry.
2				0		0.9 to 2.6 feet: GRAVELLY SAND (SW); tan; 70% sand, fine to coarse; 30% gravel, fine to coarse, subangular to rounded; very loose; no odor; dry.
3		54				@ 2.1 feet: becomes moist. @ 2.4 to 2.6 feet: cobbles, rounded. 2.6 to 2.7 feet: SILTY GRAVELLY SAND (SM); greenish-gray; 20% fines, nonplastic; 60% sand, medium to coarse; 20% gravel, fine to medium, subangular to subrounded; dense; no odor; moist. 2.7 to 5.0 feet: NO RECOVERY.
4						
5						
6				0		5.0 to 5.9 feet: SILTY GRAVELLY SAND (SM); greenish-gray; 20% fines, nonplastic; 60% sand, medium to coarse; 20% gravel, fine to medium, subangular to subrounded; dense; no odor; moist.
7			TWA-SB-10-2-6.5	0		5.9 to 6.1 feet: WOODY DEBRIS; dark brown; 100% organic material (wood dust and fibers); medium dense; no odor; moist. 6.1 to 6.8 feet: SILTY GRAVELLY SAND (SM); greenish-gray; 20% fines, nonplastic; 60% sand, medium to coarse; 20% gravel, fine to medium, subangular to subrounded; dense; no odor; moist.
8	▽	68		0		6.8 to 7.4 feet: SANDY ORGANICS; dark gray brown; 60% sand, fine to medium; 40% organic material (wood chips and fibers); medium dense; no odor; moist. 7.4 to 8.3 feet: WOODY DEBRIS; dark brown; 100% organic material (wood chips, dust, and fibers); medium dense; organic-like odor; moist. 8.3 to 8.4 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
9						8.4 to 10.0 feet: NO RECOVERY.
10						
11				0		10.0 to 12.8 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
12		76		0		
13						12.8 to 15.0 feet: NO RECOVERY.
14						
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-10**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				0		15.0 to 17.5 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
17		90				
18				0		17.5 to 18.6 feet: SILT WITH SAND (ML); gray; 80% fines, nonplastic; 20% sand, fine; soft; no odor; wet.
19						18.6 to 19.5 feet: SILT (ML); gray; 100% fines, nonplastic; soft; no odor; wet.
20						19.5 to 20.0 feet: NO RECOVERY.

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 8.4 feet as observed in the core liner at time of drilling.***

Geologic Borehole Log

MAUL FOSTER ALONGI

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-11	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
0				1		0.0 to 1.4 feet: GRAVELLY SAND (SP); tannish-gray; 70% sand, fine to medium; 30% gravel, fine to medium, rounded to subrounded; very loose; no odor; dry.
1						@ 0.7 feet: segment of wire and wire insulation. @ 0.8 to 1.4 feet: sand becomes medium to coarse; tan. @ 1.3 feet: pieces of copper wire, no insulation.
				0		@ 1.4 feet: 1.5" by 1.5" piece of rose-gold pleather.
2			TWA-SB-11-S-1.7			1.4 to 2.1 feet: SILTY SAND WITH GRAVEL (SM); bluish-gray; 20% fines, low plasticity; 70% sand, medium; 10% gravel, fine to medium, rounded to subrounded; dense; no odor; moist. @ 1.7 feet: piece of silver colored metal. @ 2.0 feet: piece of yellow foam.
3		56				2.1 to 2.8 feet: WASTE WITH SAND AND SILT; brown; 20% fines, nonplastic; 20% sand, fine; loose; 60% debris (fabric, foam, copper wire, pieces of plastic, chunks of silver metal), no odor; moist.
4						2.8 to 5.0 feet: NO RECOVERY.
5						5.0 to 5.6 feet: WASTE WITH SAND AND SILT; brown; 20% fines, nonplastic; 20% sand, fine; loose; 60% debris (fabric, foam, copper wire, pieces of plastic, chunks of silver metal), no odor; moist.
6				0		5.6 to 8.4 feet: WOODY DEBRIS; brown; 100% organic material (wood chips, fibers, and dust); loose; no odor; moist.
7	▽		TWA-SB-11-S-6			@ 7.2 feet: becomes wet.
		68		0		
8						
9						8.4 to 10.0 feet: NO RECOVERY.
10						
11				0		10.0 to 13.6 feet: WOODY DEBRIS; brown; 100% organic material (wood chips, fibers, and dust); loose; no odor; moist. @ 10.3 to 10.4 feet: black; no odor.
12						@ 11.3 to 11.6 feet: 100% wood chips.
		72				
13				0		
14						13.6 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-11**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16			**TWA-SB-11-S-16**	**0**		*15.0 to 20.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; soft; trace roots; no odor; wet.*
17		**100**				*@ 15.9 feet: roots disappear.*
18				**0**		
19						
20						

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 7.2 feet as observed in the core liner at time of drilling.***

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-12**	**1 of 2**

Project Name	**Hylebos Marsh Subsurface Investigation**		
Project Location	**Tacoma, Washington**	Surface Elevation (feet)	
Start/End Date	**8/13/2024 to 8/13/2024**	Northing	
Driller/Equipment	**Anderson Environmental Contracting, LLC/Geoprobe 7822DT**	Easting	
Geologist/Engineer	**C. Sifford**	Total Depth of Borehole	**20.0 feet**
Sample Method	**Macro-Core**	Outer Hole Diam	**2.25 inch**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				0		0.0 to 3.3 feet: SAND WITH GRAVEL (SP); tan ; 90% sand, fine to medium; 10% gravel, fine to medium, subangular to rounded; very loose; no odor; dry.
						@ 0.4 to 0.5 feet: chunk of white powdery material.
2				0		
		66				@ 2.3 feet: chunk of white powdery material.
3						@ 3.0 feet: chunk of white powdery material.
						3.3 to 5.0 feet: NO RECOVERY.
4						
5						
						5.0 to 6.8 feet: SAND WITH GRAVEL (SP); tan ; 90% sand, fine to medium; 10% gravel, fine to medium, subangular to rounded; very loose; no odor; dry.
6						@ 6.1 feet: becomes gray.
				1		
7						6.8 to 7.1 feet: SAND WITH WASTE; gray; 80% sand, fine; loose; 20% debris (plastic, fabric, yellow foam chunks, copper wire), slight chemical-like odor; dry.
		94				7.1 to 8.2 feet: WASTE WITH SILTY SAND; dark gray; 10% fines; 20% sand, fine to medium; loose; 70% debris (fabric, yellow foam, abundant copper wires without insulation), moderate chemical-like odor; moist.
8				2		@ 7.4 to 7.5 feet: large chunks of rubber window gasket.
			TWA-SB-12-S-8			@ 7.7 feet: large piece of 1/8" thick rubbery plastic material.
						@ 7.9 feet: piece of glass.
9				3		8.2 to 8.5 feet: WASTE WITH SILTY SAND; black; 5% fines; 15% sand, fine; loose; 80% debris (sheets of rubber, large copper bar (2" wide), abundant fine metal wires, pieces of fabric and plastic), strong chemical-like odor; moist.
			TWA-SB-12-S-9			8.5 to 9.7 feet: SAND (SP); light gray; 100% sand, fine to medium; very dense; cemented together with white chalky material, strong rancid odor; dry.
10						@ 8.8 feet: brown fibers and white plastic.
						@ 9.4 feet: 4" long piece of 1/8" metal wire.
						9.7 to 10.0 feet: NO RECOVERY.
11				8		10.0 to 14.3 feet: SAND (SP); light gray; 100% sand, fine to medium; very dense; cemented together with white chalky material, strong rancid odor; dry.
						@ 10.3 to 10.6 feet: large chunks of black rubber material.
						@ 11.3 to 11.5 feet: white; 100% fine grained paste; nonplastic; soft; strong rancid odor; moist.
12						@ 11.4 feet: 1.5" rounds 1/2" thick black rubber O-ring.
		86				@ 12.4 feet: blue plastic chunk.
13				6		
						@ 13.3 feet: cluster of yellow fibers.
14						
						14.3 to 15.0 feet: NO RECOVERY.
15						

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-12**	**2 of 2**

Depth (feet, bgs)	Water Levels	Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				3		15.0 to 16.2 feet: SAND (SP); light gray; 100% sand, fine; medium dense; cemented together with white chalky material, strong rancid odor; moist. @ 16.1 feet: piece of shredded plastic.
17		100	TWA-SB-12-S-16.9			16.2 to 17.5 feet: SILTY GRAVELLY SAND (SM); brown; 30% fines, low plasticity; 40% sand, fine to medium; 30% gravel, medium, rounded; medium dense; moderate chemical-like odor; moist. @ 16.9 feet: 3/4" lens of sticky/stringy tar-like material, with a copper wire.
18						17.5 to 19.4 feet: SAND (SP); light gray; 100% sand, fine to medium; very dense; cemented together with white chalky material, strong rancid odor, no debris observed; moist. @ 18.0 to 18.3 feet: white; 100% fine grained paste; nonplastic; soft; strong rancid odor; moist.
19	▽		TWA-SB-12-S-18.5	1		@ 18.8 to 19.1 feet: dark gray layer of 70% fines, low plasticity; 30% sand, fine; firm; some rootlets; strong rancid odor; moist.
20						19.4 to 20.0 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; wet.

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 19.4 feet as observed in the core liner at time of drilling.***

Geologic Borehole Log

MAUL FOSTER ALONGI

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-13	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				1		0.0 to 1.7 feet: SAND WITH SILT AND GRAVEL (SP-SM); tan; 10% fines; 80% sand, fine to medium; 10% gravel, fine, rounded to subrounded; very loose; occasional pieces of bark throughout; no odor; dry.
2				1		1.7 to 2.1 feet: SAND WITH SILT AND GRAVEL (SP-SM); black; 10% fines; 80% sand, fine to medium; 10% gravel, fine, rounded to subrounded; very loose; occasional pieces of bark throughout; no odor; dry.
3		56				@ 2.0 feet: piece of plastic textile. 2.1 to 2.5 feet: light gray; 100% cobbles; shattered. 2.5 to 2.8 feet: ORGANIC MATERIAL WITH SAND AND DEBRIS; brown; 40% sand, medium; 40% organic material (wood chunks and chips); loose; 20% debris (red and clear plastic sheeting, broken glass, and a chunk of black plastic); no odor; dry
4						2.8 to 5.0 feet: NO RECOVERY.
5						@ 5.0 feet: piece of yellow plastic at tip of core.
6				1		5.0 to 6.1 feet: SILT (ML); white; 90% fines, nonplastic; 10% gravel, medium, subrounded; soft; paste-like; no odor; moist. @ 6.0 to 6.1 feet: WOODY DEBRIS; rotten wood chunk.
7	▽		TWA-SB-13-S-7.5	8		6.1 to 7.5 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; moist. @ 6.4 to 6.5 feet: tan; 30% fines, nonplastic; 70% sand; firm; medium dense; no odor; moist. @ 7.1 feet: becomes wet.
8		50		1		7.5 to 10.0 feet: NO RECOVERY.
9						
10						
11				2		10.0 to 12.1 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet. @ 10.3 to 10.5 feet: tan; 30% fines, nonplastic; 70% sand; firm; medium dense; no odor; moist.
12						
13		70		0		12.1 to 13.5 feet: SANDY SILT (ML); gray; 50% fines, low plasticity; 50% sand, fine to medium; firm; occasional rootlets throughout; no odor; wet.
14						13.5 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-13**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				1		15.0 to 16.1 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; wet.
17						16.1 to 17.3 feet: SILTY SAND (SM); dark gray; 30% fines, low plasticity; 70% sand, medium; medium dense; no odor; wet.
18		46				17.3 to 20.0 feet: NO RECOVERY.
19						
20						

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 7.1 feet as observed in the core liner at time of drilling.***

Geologic Borehole Log

MAUL FOSTER ALONGI

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-14**	**1 of 2**

Project Name	**Hylebos Marsh Subsurface Investigation**		
Project Location	**Tacoma, Washington**	Surface Elevation (feet)	
Start/End Date	**8/13/2024 to 8/13/2024**	Northing	
Driller/Equipment	**Anderson Environmental Contracting, LLC/Geoprobe 7822DT**	Easting	
Geologist/Engineer	**C. Sifford**	Total Depth of Borehole	**20.0 feet**
Sample Method	**Macro-Core**	Outer Hole Diam	**2.25 inch**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				2		0.0 to 2.0 feet: GRAVELLY SAND (SP); tan; 80% sand, fine to medium; 20% gravel, fine to medium, rounded to subrounded; very loose; no odor; dry.
				3		@ 1.5 feet: piece of 1/8" thick rubber sheet.
2			**TWA-SB-14-S-1.5**			@ 1.6 feet: becomes light tan.
						@ 1.7 feet: chunk of wood, 3/4" thick.
						2.0 to 2.6 feet: SILT (ML); pure white; 100% fines, low plasticity; firm; paste-like; no odor; moist.
		68		2		2.6 to 3.4 feet: SAND (SP); dark gray; 100% sand, medium; very loose; no odor; moist.
3						@ 3.1 feet: shell.
4						3.4 to 5.0 feet: NO RECOVERY.
5	▽					5.0 to 5.5 feet: SILT (ML); pure white; 100% fines, low plasticity; very soft; paste-like; no odor; wet.
6				6		5.5 to 9.0 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
7						
8				4		@ 8.1 to 8.3 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
9						9.0 to 10.0 feet: NO RECOVERY.
10		**80**				10.0 to 13.8 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
11				1		
12						@ 11.7 to 11.9 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
						@ 12.0 feet: large shell.
		86				
13						@ 12.8 to 13.1 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
				1		
14						13.8 to 14.3 feet: SILT (ML); gray; 100% fines, nonplastic; soft; no odor; wet.
						14.3 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-14**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				1		15.0 to 17.2 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; trace fines; wet. @ 15.2 to 15.3 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet. @ 16.4 to 16.5 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
17						
18		100		1		17.2 to 18.7 feet: SILT (ML); gray; 100% fines, nonplastic; soft; no odor; wet. @ 17.3 feet: shell.
19						18.7 to 20.0 feet: SANDY SILT (ML); dark gray; 50% fines, medium plasticity; 50% sand, medium; soft; no odor; wet.
20						

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 5.0 feet as observed in the core liner at time of drilling.***

Geologic Borehole Log

MAUL FOSTER ALONGI

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-15	1 of 1

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	15.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				1		0.0 to 2.3 feet: GRAVELLY SAND WITH SILT (SP-SM); tan; 10% fines; 65% sand, medium; 25% gravel, fine to medium, rounded to subrounded; loose; no odor; dry.
2			TWA-SB-15-S-1.7	2.5		@ 1.3 feet: becomes moist.
3		68		1		2.3 to 3.4 feet: SAND WITH SILT (SP-SM); dark gray with orange mottling; 10% fines; 90% sand, medium; dense; no odor; moist.
4						3.4 to 5.0 feet: NO RECOVERY.
5						5.0 to 8.3 feet: SAND WITH SILT (SP-SM); dark gray with orange mottling; 10% fines; 90% sand, medium; dense; no odor; moist.
6	▽			1		@ 5.7 feet: no more mottling; occasional shell fragments.
7						@ 6.1 to 6.2 feet: layer of tan; 100% fines, medium plasticity; soft; no odor; wet.
8		66		1		@ 6.2 feet: becomes wet.
9						8.3 to 10.0 feet: NO RECOVERY.
10						10.0 to 11.5 feet: SAND WITH SILT (SP-SM); dark gray with orange mottling; 10% fines; 90% sand, medium; dense; no odor; wet.
11				1		
12		96		1		11.5 to 13.2 feet: SILTY SAND (SM); dark gray; 40% fines, medium plasticity; 60% sand, medium; medium dense; no odor; wet.
13						
14				1		13.2 to 13.6 feet: CLAY (CL); dark gray; 100% fines, high plasticity; soft; no odor; wet. 13.6 to 14.8 feet: PEAT (PT); dark brown; 10% fines, low plasticity; 90% organic material (peat and rootlets); firm; no odor; wet. @ 14.2 feet: fines increase to 30%; becomes dark brown with black mottling.
15						14.8 to 15.0 feet: NO RECOVERY.

Total Depth = 15.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet: 2-inch-diameter borehole.
0.0 to 15.0 feet: Bentonite chips hydrated with potable water.

▽ **Soil becomes wet at approximately 6.1 feet as observed in the core liner at time of drilling.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

MAUL FOSTER ALONGI

Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-16	1 of 1

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	15.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1						0.0 to 2.0 feet: SAND (SP); gray; 100% sand, medium; very loose; rootlets present from 0.09'; no odor; dry.
						@ 0.9 to 1.4 feet: orange staining.
2	▽		TWA-SB-16-S-1.5	0		@ 1.7 feet: becomes moist.
		76				2.0 to 2.4 feet: SILT WITH SAND (ML); gray ; 80% fines, medium plasticity; 20% sand, fine; soft; no odor; wet.
3				0		2.4 to 3.8 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
4						3.8 to 5.0 feet: NO RECOVERY.
5						
6				0		5.0 to 6.9 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
7						6.9 to 7.7 feet: SILT WITH SAND (ML); gray; 80% fines, medium plasticity; 20% sand, fine; soft; trace rootlets; no odor; wet.
		82		0		
8						7.7 to 9.1 feet: SILT (ML); gray; 100% fines, medium plasticity; soft; no odor; wet.
9						
10						9.1 to 10.0 feet: NO RECOVERY.
						10.0 to 12.9 feet: SILT (ML); gray; 100% fines, medium plasticity; soft; no rootlets; no odor; wet.
11				0		
12				0		@ 11.4 feet: plasticity becomes high.
		58				
13						12.9 to 15.0 feet: NO RECOVERY.
14						
15						

Total Depth = 15.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet: 2-inch-diameter borehole.
0.0 to 15.0 feet: Bentonite chips hydrated with potable water.

▽ **Soil becomes wet at approximately 2.0 feet as observed in the core liner at time of drilling.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Attachment E

Laboratory Report

MAUL FOSTER ALONGI

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

September 3, 2024

Audrey Hackett, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

Dear Ms Hackett:

Included is the amended report from the testing of material submitted on August 13, 2024 from the TWAAFA M0615.20.014, F&BI 408228 project. Only the overrange SVOC compounds were reported in the subsequent dilutions.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Christian Sifford, Fiona Bellows
MFA0903R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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September 3, 2024

Audrey Hackett, Project Manager
Maul Foster Alongi
2815 2nd Ave, Suite 540
Seattle, WA 98121

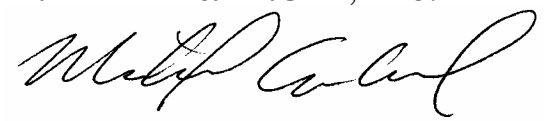
Dear Ms Hackett:

Included are the results from the testing of material submitted on August 13, 2024 from the TWAAFA M0615.20.014, F&BI 408228 project. There are 116 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Christian Sifford
MFA0903R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 13, 2024 by Friedman & Bruya, Inc. from the Maul Foster Alongi TWAAFA M0615.20.014, F&BI 408228 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Maul Foster Alongi
408228 -01	TWA-SB-09-S-6.0
408228 -02	TWA-SB-16-S-1.5
408228 -03	TWA-SB-10-S-6.5
408228 -04	TWA-SB-11-S-1.7
408228 -05	TWA-SB-11-S-6.0
408228 -06	TWA-SB-11-S-16.0
408228 -07	TWA-SB-12-S-8.0
408228 -08	TWA-SB-12-S-9.0
408228 -09	TWA-SB-12-S-16.9
408228 -10	TWA-SB-12-S-18.5
408228 -11	TWA-SB-13-S-7.5
408228 -12	TWA-SB-14-S-1.5
408228 -13	TWA-SB-15-S-1.7
408228 -14	Trip Blank

The NWTPH-Dx motor oil range calibration standard exceeded the acceptance criteria for sample TWA-SB-09-S-6.0 and the method blank. No material was detected in that range, therefore this did not represent an out of control condition, and was qualified with a "k" qualifier.

The 8260D and 8270E calibration standard exceeded the acceptance criteria for several compounds. The compounds were not detected, therefore this did not represent an out of control condition, and the results are not considered estimates.

The 8260D and 8270E calibration standard did not meet the acceptance criteria for several analytes. The data were flagged accordingly.

The 8260D and 8270E matrix spike and matrix spike duplicate exceeded the relative percent difference acceptance criteria for several compounds. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

All other quality control requirements were acceptable.

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: NA
Date Analyzed: 08/20/24

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98

Sample ID Laboratory ID	% Moisture
TWA-SB-09-S-6.0 408228-01	19
TWA-SB-16-S-1.5 408228-02	3
TWA-SB-10-S-6.5 408228-03	14
TWA-SB-11-S-1.7 408228-04	11
TWA-SB-11-S-6.0 408228-05	37
TWA-SB-11-S-16.0 408228-06	23
TWA-SB-12-S-8.0 408228-07	17
TWA-SB-12-S-9.0 408228-08	22
TWA-SB-12-S-16.9 408228-09	18
TWA-SB-12-S-18.5 408228-10	27
TWA-SB-13-S-7.5 408228-11	17
TWA-SB-14-S-1.5 408228-12	5

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: NA
Date Analyzed: 08/20/24

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR PERCENT MOISTURE USING ASTM D2216-98

Sample ID Laboratory ID	% Moisture
TWA-SB-15-S-1.7 408228-13	8

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: 08/19/24
Date Analyzed: 08/19/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID

Results Reported on a Dry Weight Basis
Results Reported as Not Detected (ND) or Detected (D)

THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT

Sample ID Laboratory ID	Gasoline	Diesel	Heavy Oil	Surrogate (% Recovery) (Limit 50-150)
TWA-SB-12-S-16.9 408228-09	ND	ND	D	111
Method Blank 04-2043 MB	ND	ND	ND	103

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: 08/16/24 and 08/22/24
Date Analyzed: 08/16/24 and 08/22/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
TWA-SB-09-S-6.0 408228-01	<2	94
TWA-SB-16-S-1.5 408228-02	3.0	85
TWA-SB-10-S-6.5 408228-03	<2	89
TWA-SB-11-S-1.7 408228-04	<2	92
TWA-SB-11-S-6.0 408228-05	<2	101
TWA-SB-11-S-16.0 408228-06	<2	99
TWA-SB-12-S-8.0 408228-07	51	98
TWA-SB-12-S-9.0 408228-08	14	92
TWA-SB-12-S-18.5 408228-10	39	98
TWA-SB-13-S-7.5 408228-11	4.6	90
TWA-SB-14-S-1.5 408228-12	<2	85

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: 08/16/24 and 08/22/24
Date Analyzed: 08/16/24 and 08/22/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
TWA-SB-15-S-1.7 408228-13	<2	92
Method Blank 04-1760 MB	<2	85
Method Blank 04-1948 MB	<2	102

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: 08/20/24 and 08/27/24
Date Analyzed: 08/20/24 and 08/27/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
TWA-SB-09-S-6.0 408228-01	<25	<120 k	124
TWA-SB-16-S-1.5 408228-02	<25	<120	117
TWA-SB-10-S-6.5 408228-03	<25	<120	120
TWA-SB-11-S-1.7 408228-04	120 x	600	118
TWA-SB-11-S-6.0 408228-05	73 x	<120	120
TWA-SB-11-S-16.0 408228-06	<25	<120	124
TWA-SB-12-S-8.0 408228-07 1/10	2,400 x	8,300	114
TWA-SB-12-S-9.0 408228-08	1,500 x	3,300	122
TWA-SB-12-S-16.9 408228-09	510 x	1,400	124
TWA-SB-12-S-18.5 408228-10	520 x	1,100	119
TWA-SB-13-S-7.5 408228-11	<25	<120	118
TWA-SB-14-S-1.5 408228-12	44 x	<120	118

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228
Date Extracted: 08/20/24 and 08/27/24
Date Analyzed: 08/20/24 and 08/27/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
TWA-SB-15-S-1.7 408228-13	<25	<120	118
Method Blank 04-2046 MB	<25	<120 k	123
Method Blank 04-2077 MB	<25	<120	116

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Trip Blank	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-14
Date Analyzed:	08/16/24	Data File:	081611.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	104	72	130

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.02	Dibromochloromethane	<0.5
Bromomethane	<5	1,2-Dibromoethane (EDB)	<0.01
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50 ca	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<20 ca	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.5	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.5	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.5	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.4	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.4	Naphthalene	<1
1,1,2-Trichloroethane	<0.5	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	04-1846 mb
Date Analyzed:	08/16/24	Data File:	081609.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	106	72	130

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.02	Dibromochloromethane	<0.5
Bromomethane	<5	1,2-Dibromoethane (EDB)	<0.01
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50 ca	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<20 ca	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.5	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.5	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.5	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.4	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.4	Naphthalene	<1
1,1,2-Trichloroethane	<0.5	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-09-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-01 1/0.5
Date Analyzed:	08/16/24	Data File:	081612.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	84	120
Toluene-d8	94	73	128
4-Bromofluorobenzene	104	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-16-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-02 1/0.5
Date Analyzed:	08/16/24	Data File:	081613.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	84	120
Toluene-d8	92	73	128
4-Bromofluorobenzene	103	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	0.0075 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-10-S-6.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-03 1/0.5
Date Analyzed:	08/16/24	Data File:	081614.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	94	84	120
Toluene-d8	94	73	128
4-Bromofluorobenzene	105	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-11-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-04 1/0.5
Date Analyzed:	08/16/24	Data File:	081615.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	84	120
Toluene-d8	94	73	128
4-Bromofluorobenzene	105	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-11-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/21/24	Lab ID:	408228-05 1/0.5
Date Analyzed:	08/21/24	Data File:	082122.D
Matrix:	Soil	Instrument:	GCMS11
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	79	128
Toluene-d8	100	84	121
4-Bromofluorobenzene	100	84	116

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j	Ethylbenzene	0.0087
Acetone	<1 j ca	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	0.057
Hexane	<0.25 j	o-Xylene	0.035
Methylene chloride	<0.11 j	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	0.048 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	0.016 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	0.0017	1,3,5-Trimethylbenzene	0.022 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	0.088
Benzene	0.012	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	0.0092 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	0.068	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	0.043
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-11-S-16.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/21/24	Lab ID:	408228-06 1/0.5
Date Analyzed:	08/21/24	Data File:	082123.D
Matrix:	Soil	Instrument:	GCMS11
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	79	128
Toluene-d8	98	84	121
4-Bromofluorobenzene	105	84	116

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j	Ethylbenzene	<0.002
Acetone	<1 j ca	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	0.0035	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	0.0064 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	0.014	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	0.015
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-07 1/0.5
Date Analyzed:	08/16/24	Data File:	081611.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	84	120
Toluene-d8	95	73	128
4-Bromofluorobenzene	100	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	0.0035
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	0.024 j ca	Ethylbenzene	0.58
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	0.62
Hexane	<0.25 j	o-Xylene	0.43
Methylene chloride	<0.11 j ca	Styrene	0.087
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	0.13
trans-1,2-Dichloroethene	0.0094	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	0.17
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	0.0097	1,3,5-Trimethylbenzene	0.41
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	0.92
Benzene	0.014	sec-Butylbenzene	0.043 j
Trichloroethene	0.0056	p-Isopropyltoluene	0.089
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	0.0057 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	0.016 j
Toluene	0.13	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	0.47
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-07 1/0.5
Date Analyzed:	08/21/24	Data File:	082128.D
Matrix:	Soil	Instrument:	GCMS11
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	79	128
Toluene-d8	98	84	121
4-Bromofluorobenzene	104	84	116

Compounds:	Concentration mg/kg (ppm)
Trichlorofluoromethane	0.012 j

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-08 1/0.5
Date Analyzed:	08/16/24	Data File:	081609.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	84	120
Toluene-d8	106	73	128
4-Bromofluorobenzene	98	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	0.082
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	0.0080 j
Trichlorofluoromethane	0.10 j ca	Ethylbenzene	0.077
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	0.10
Hexane	<0.25 j	o-Xylene	0.057
Methylene chloride	<0.11 j ca	Styrene	0.064
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	0.018 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	0.014 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	0.0080	1,3,5-Trimethylbenzene	0.0275 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	0.021 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	0.0083 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	0.071
Benzene	0.012	sec-Butylbenzene	0.0064 j
Trichloroethene	0.028	p-Isopropyltoluene	0.022 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	0.0092 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	0.0053 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	0.020 j
Toluene	0.045	Hexachlorobutadiene	0.011 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	0.19
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	0.012 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-08 1/0.5
Date Analyzed:	08/21/24	Data File:	082129.D
Matrix:	Soil	Instrument:	GCMS11
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	79	128
Toluene-d8	100	84	121
4-Bromofluorobenzene	105	84	116

Compounds:	Concentration mg/kg (ppm)
Trichlorofluoromethane	0.081 j

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-10 1/0.5
Date Analyzed:	08/16/24	Data File:	081610.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	84	120
Toluene-d8	102	73	128
4-Bromofluorobenzene	104	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	0.49
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	0.025
Trichlorofluoromethane	2.8 ca	Ethylbenzene	0.044
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	0.062
Hexane	<0.25 j	o-Xylene	0.032
Methylene chloride	<0.11 j ca	Styrene	0.053
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	0.014 j
trans-1,2-Dichloroethene	0.0024	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	0.014 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	0.068	1,3,5-Trimethylbenzene	0.023 j
Chloroform	0.0098 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	0.019 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	0.012 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	0.071
Benzene	0.024	sec-Butylbenzene	0.0060 j
Trichloroethene	0.64	p-Isopropyltoluene	0.019 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	0.0095 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	0.0059 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	0.017 j
Toluene	0.069	Hexachlorobutadiene	0.015 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	0.23
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-10 1/0.5
Date Analyzed:	08/21/24	Data File:	082130.D
Matrix:	Soil	Instrument:	GCMS11
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	79	128
Toluene-d8	98	84	121
4-Bromofluorobenzene	108	84	116

Compounds:	Concentration mg/kg (ppm)
Trichlorofluoromethane	1.7

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-13-S-7.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-11 1/0.5
Date Analyzed:	08/16/24	Data File:	081616.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	84	120
Toluene-d8	97	73	128
4-Bromofluorobenzene	102	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-14-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-12 1/0.5
Date Analyzed:	08/16/24	Data File:	081608.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	84	120
Toluene-d8	103	73	128
4-Bromofluorobenzene	100	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	0.0040
Hexane	<0.25 j	o-Xylene	0.0025
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	0.0046	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	0.0075 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	TWA-SB-15-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	408228-13 1/0.5
Date Analyzed:	08/16/24	Data File:	081617.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	91	84	120
Toluene-d8	95	73	128
4-Bromofluorobenzene	102	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/16/24	Lab ID:	04-1847 mb 1/0.5
Date Analyzed:	08/16/24	Data File:	081606.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	84	120
Toluene-d8	94	73	128
4-Bromofluorobenzene	105	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j k	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j k	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j k	Ethylbenzene	<0.002
Acetone	<1 j	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j ca	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j k
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition LL

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/21/24	Lab ID:	04-2011 mb 1/0.5
Date Analyzed:	08/21/24	Data File:	082106.D
Matrix:	Soil	Instrument:	GCMS13
Units:	mg/kg (ppm) Dry Weight	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	84	120
Toluene-d8	95	73	128
4-Bromofluorobenzene	102	57	146

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.01 j	1,3-Dichloropropane	<0.007 j
Chloromethane	<0.044 j	Tetrachloroethene	<0.002
Vinyl chloride	<0.002	Dibromochloromethane	<0.005 j
Bromomethane	<0.095 j	1,2-Dibromoethane (EDB)	<0.005
Chloroethane	<0.07 j	Chlorobenzene	<0.005 j
Trichlorofluoromethane	<0.005 j	Ethylbenzene	<0.002
Acetone	<1 j ca	1,1,1,2-Tetrachloroethane	<0.0065 j
1,1-Dichloroethene	<0.002	m,p-Xylene	<0.004
Hexane	<0.25 j	o-Xylene	<0.002
Methylene chloride	<0.11 j	Styrene	<0.005 j
Methyl t-butyl ether (MTBE)	<0.002	Isopropylbenzene	<0.005 j
trans-1,2-Dichloroethene	<0.002	Bromoform	<0.0065 j
1,1-Dichloroethane	<0.002	n-Propylbenzene	<0.005 j
2,2-Dichloropropane	<0.013 j	Bromobenzene	<0.005 j
cis-1,2-Dichloroethene	<0.002	1,3,5-Trimethylbenzene	<0.005 j
Chloroform	<0.006 j	1,1,2,2-Tetrachloroethane	<0.0065 j
2-Butanone (MEK)	<0.47 j	1,2,3-Trichloropropane	<0.005 j
1,2-Dichloroethane (EDC)	<0.003	2-Chlorotoluene	<0.005 j
1,1,1-Trichloroethane	<0.002	4-Chlorotoluene	<0.005 j
1,1-Dichloropropene	<0.005 j	tert-Butylbenzene	<0.005 j
Carbon tetrachloride	<0.008 j	1,2,4-Trimethylbenzene	<0.005 j
Benzene	<0.002	sec-Butylbenzene	<0.005 j
Trichloroethene	<0.002	p-Isopropyltoluene	<0.005 j
1,2-Dichloropropane	<0.008 j	1,3-Dichlorobenzene	<0.005 j
Bromodichloromethane	<0.006 j	1,4-Dichlorobenzene	<0.005 j
Dibromomethane	<0.0065 j	1,2-Dichlorobenzene	<0.005 j
4-Methyl-2-pentanone	<0.24 j	1,2-Dibromo-3-chloropropane	<0.049 j
cis-1,3-Dichloropropene	<0.0055 j	1,2,4-Trichlorobenzene	<0.005 j
Toluene	<0.002	Hexachlorobutadiene	<0.005 j
trans-1,3-Dichloropropene	<0.005 j	Naphthalene	<0.005 j
1,1,2-Trichloroethane	<0.005 j	1,2,3-Trichlorobenzene	<0.005 j
2-Hexanone	<0.43 j		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-09-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-01 1/5
Date Analyzed:	08/19/24	Data File:	081918.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	71	14	115
Phenol-d6	81	29	121
Nitrobenzene-d5	79	16	137
2-Fluorobiphenyl	89	46	122
2,4,6-Tribromophenol	88	17	154
Terphenyl-d14	84	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	<0.0025
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	<0.0025
Naphthalene	<0.005	Pyrene	<0.0025
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	<0.0025
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-16-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-02 1/5
Date Analyzed:	08/19/24	Data File:	081919.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	64	14	115
Phenol-d6	74	29	121
Nitrobenzene-d5	75	16	137
2-Fluorobiphenyl	83	46	122
2,4,6-Tribromophenol	76	17	154
Terphenyl-d14	80	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	<0.0025
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	<0.0025
Naphthalene	<0.005	Pyrene	<0.0025
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	0.0056
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-10-S-6.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-03 1/5
Date Analyzed:	08/19/24	Data File:	081920.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	66	14	115
Phenol-d6	76	29	121
Nitrobenzene-d5	79	16	137
2-Fluorobiphenyl	89	46	122
2,4,6-Tribromophenol	82	17	154
Terphenyl-d14	86	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	0.0058
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	0.0054
Naphthalene	<0.005	Pyrene	0.0066
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	0.0034
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	0.0030
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-11-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-04 1/25
Date Analyzed:	08/20/24	Data File:	082016.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	59 d	22	119
Phenol-d6	70 d	38	124
Nitrobenzene-d5	69 d	10	198
2-Fluorobiphenyl	82 d	45	117
2,4,6-Tribromophenol	92 d	11	158
Terphenyl-d14	87 d	50	124

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.25	3-Nitroaniline	<25
Phenol	<1.2	Acenaphthene	<0.012
Bis(2-chloroethyl) ether	<0.25	2,4-Dinitrophenol	<7.5
2-Chlorophenol	<2.5	Dibenzofuran	<0.012
1,3-Dichlorobenzene	<0.25	2,4-Dinitrotoluene	<1.2
1,4-Dichlorobenzene	<0.25	4-Nitrophenol	<7.5
1,2-Dichlorobenzene	<0.25	Diethyl phthalate	<2.5
Benzyl alcohol	<2.5	Fluorene	<0.012
2,2'-Oxybis(1-chloropropane)	<0.25	4-Chlorophenyl phenyl ether	<0.25
2-Methylphenol	<2.5	1,2-Diphenylhydrazine	<0.25
Hexachloroethane	<0.25	N-Nitrosodiphenylamine	<0.25
N-Nitroso-di-n-propylamine	<0.25	4-Nitroaniline	<25
3-Methylphenol + 4-Methylphenol	<5	4,6-Dinitro-2-methylphenol	<7.5
Nitrobenzene	<0.25	4-Bromophenyl phenyl ether	<0.25
Isophorone	<0.25	Hexachlorobenzene	<0.25
2-Nitrophenol	<2.5	Pentachlorophenol	<1.2
2,4-Dimethylphenol	<2.5	Phenanthrene	0.028
Benzoic acid	<12 ca	Anthracene	<0.012
Bis(2-chloroethoxy)methane	<0.25	Carbazole	<0.012
2,4-Dichlorophenol	<2.5	Di-n-butyl phthalate	<2.5
1,2,4-Trichlorobenzene	<0.25	Fluoranthene	0.027
Naphthalene	<0.025	Pyrene	0.065
Hexachlorobutadiene	<0.25	Benzyl butyl phthalate	6.7
4-Chloroaniline	<25	3,3'-Dichlorobenzidine	<2.5
4-Chloro-3-methylphenol	<2.5	Benz(a)anthracene	<0.025
2-Methylnaphthalene	<0.012	Chrysene	0.056
1-Methylnaphthalene	<0.012	Bis(2-ethylhexyl) phthalate	17 fc
Hexachlorocyclopentadiene	<0.75	Di-n-octyl phthalate	<2.5
2,4,6-Trichlorophenol	<2.5	Benzo(a)pyrene	0.045
2,4,5-Trichlorophenol	<2.5	Benzo(b)fluoranthene	0.048
2-Chloronaphthalene	<0.25	Benzo(k)fluoranthene	<0.012
2-Nitroaniline	<1.2	Indeno(1,2,3-cd)pyrene	0.036
Dimethyl phthalate	<2.5	Dibenz(a,h)anthracene	<0.025
Acenaphthylene	<0.012	Benzo(g,h,i)perylene	0.10
2,6-Dinitrotoluene	<1.2		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-11-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-05 1/5
Date Analyzed:	08/19/24	Data File:	081921.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	73	14	115
Phenol-d6	81	29	121
Nitrobenzene-d5	86	16	137
2-Fluorobiphenyl	90	46	122
2,4,6-Tribromophenol	91	17	154
Terphenyl-d14	91	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	0.0027
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	0.0054
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	0.0028
Naphthalene	0.0059	Pyrene	0.0040
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	<0.0025
1-Methylnaphthalene	0.0027	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-11-S-16.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-06 1/5
Date Analyzed:	08/19/24	Data File:	081922.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	74	14	115
Phenol-d6	83	29	121
Nitrobenzene-d5	79	16	137
2-Fluorobiphenyl	80	46	122
2,4,6-Tribromophenol	86	17	154
Terphenyl-d14	83	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	<0.0025
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	<0.0025
Naphthalene	<0.005	Pyrene	<0.0025
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	<0.0025
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-07 1/100
Date Analyzed:	08/21/24	Data File:	082022.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	61 d	22	119
Phenol-d6	68 d	38	124
Nitrobenzene-d5	64 d	10	198
2-Fluorobiphenyl	70 d	45	117
2,4,6-Tribromophenol	109 d	11	158
Terphenyl-d14	96 d	50	124

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<1	3-Nitroaniline	<100
Phenol	<5	Acenaphthene	0.13
Bis(2-chloroethyl) ether	<1	2,4-Dinitrophenol	<30
2-Chlorophenol	<10	Dibenzofuran	<0.05
1,3-Dichlorobenzene	<1	2,4-Dinitrotoluene	<5
1,4-Dichlorobenzene	<1	4-Nitrophenol	<30
1,2-Dichlorobenzene	<1	Diethyl phthalate	<10
Benzyl alcohol	<10	Fluorene	0.12
2,2'-Oxybis(1-chloropropane)	<1	4-Chlorophenyl phenyl ether	<1
2-Methylphenol	<10	1,2-Diphenylhydrazine	<1
Hexachloroethane	<1	N-Nitrosodiphenylamine	<1
N-Nitroso-di-n-propylamine	<1	4-Nitroaniline	<100
3-Methylphenol + 4-Methylphenol	<20	4,6-Dinitro-2-methylphenol	<30
Nitrobenzene	<1	4-Bromophenyl phenyl ether	<1
Isophorone	<1	Hexachlorobenzene	<1
2-Nitrophenol	<10	Pentachlorophenol	<5
2,4-Dimethylphenol	<10	Phenanthrene	0.48
Benzoic acid	<50 ca	Anthracene	0.057
Bis(2-chloroethoxy)methane	<1	Carbazole	<0.05
2,4-Dichlorophenol	<10	Di-n-butyl phthalate	<10
1,2,4-Trichlorobenzene	<1	Fluoranthene	0.35
Naphthalene	0.36	Pyrene	0.85
Hexachlorobutadiene	<1	Benzyl butyl phthalate	29
4-Chloroaniline	<100	3,3'-Dichlorobenzidine	<10
4-Chloro-3-methylphenol	<10	Benz(a)anthracene	0.22
2-Methylnaphthalene	0.74	Chrysene	0.45
1-Methylnaphthalene	0.47	Bis(2-ethylhexyl) phthalate	230 ve fc
Hexachlorocyclopentadiene	<3	Di-n-octyl phthalate	19
2,4,6-Trichlorophenol	<10	Benzo(a)pyrene	0.23
2,4,5-Trichlorophenol	<10	Benzo(b)fluoranthene	0.28
2-Chloronaphthalene	<1	Benzo(k)fluoranthene	0.070
2-Nitroaniline	<5	Indeno(1,2,3-cd)pyrene	0.16
Dimethyl phthalate	<10	Dibenz(a,h)anthracene	<0.1
Acenaphthylene	<0.05	Benzo(g,h,i)perylene	0.40
2,6-Dinitrotoluene	<5		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-07 1/1000
Date Analyzed:	08/21/24	Data File:	082120.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	54 d	22	119
Phenol-d6	66 d	38	124
Nitrobenzene-d5	60 d	10	198
2-Fluorobiphenyl	80 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	100 d	50	124

Compounds:	Concentration mg/kg (ppm)
Bis(2-ethylhexyl) phthalate	320 fc

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-08 1/25
Date Analyzed:	08/21/24	Data File:	082017.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	1 d	22	119
Phenol-d6	10 d	38	124
Nitrobenzene-d5	85 d	10	198
2-Fluorobiphenyl	93 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	115 d	50	124

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.25	3-Nitroaniline	<25
Phenol	<1.2	Acenaphthene	0.11
Bis(2-chloroethyl) ether	<0.25	2,4-Dinitrophenol	<7.5
2-Chlorophenol	<2.5	Dibenzofuran	0.069
1,3-Dichlorobenzene	<0.25	2,4-Dinitrotoluene	<1.2
1,4-Dichlorobenzene	<0.25	4-Nitrophenol	<7.5
1,2-Dichlorobenzene	<0.25	Diethyl phthalate	<2.5
Benzyl alcohol	<2.5	Fluorene	0.14
2,2'-Oxybis(1-chloropropane)	<0.25	4-Chlorophenyl phenyl ether	<0.25
2-Methylphenol	<2.5	1,2-Diphenylhydrazine	<0.25
Hexachloroethane	<0.25	N-Nitrosodiphenylamine	<0.25
N-Nitroso-di-n-propylamine	<0.25	4-Nitroaniline	<25
3-Methylphenol + 4-Methylphenol	<5	4,6-Dinitro-2-methylphenol	<7.5
Nitrobenzene	<0.25	4-Bromophenyl phenyl ether	<0.25
Isophorone	<0.25	Hexachlorobenzene	0.28
2-Nitrophenol	<2.5	Pentachlorophenol	<1.2
2,4-Dimethylphenol	<2.5	Phenanthrene	0.56
Benzoic acid	<12 ca	Anthracene	0.076
Bis(2-chloroethoxy)methane	<0.25	Carbazole	0.042
2,4-Dichlorophenol	<2.5	Di-n-butyl phthalate	<2.5
1,2,4-Trichlorobenzene	<0.25	Fluoranthene	0.36
Naphthalene	0.18	Pyrene	0.79
Hexachlorobutadiene	<0.25	Benzyl butyl phthalate	2.9
4-Chloroaniline	<25	3,3'-Dichlorobenzidine	<2.5
4-Chloro-3-methylphenol	<2.5	Benz(a)anthracene	0.20
2-Methylnaphthalene	0.25	Chrysene	0.39
1-Methylnaphthalene	0.16	Bis(2-ethylhexyl) phthalate	9.1 fc
Hexachlorocyclopentadiene	<0.75	Di-n-octyl phthalate	<2.5
2,4,6-Trichlorophenol	<2.5	Benzo(a)pyrene	0.14
2,4,5-Trichlorophenol	<2.5	Benzo(b)fluoranthene	0.19
2-Chloronaphthalene	<0.25	Benzo(k)fluoranthene	0.047
2-Nitroaniline	<1.2	Indeno(1,2,3-cd)pyrene	0.085
Dimethyl phthalate	<2.5	Dibenz(a,h)anthracene	0.031
Acenaphthylene	<0.012	Benzo(g,h,i)perylene	0.18
2,6-Dinitrotoluene	<1.2		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-12-S-16.9	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	408228-09 1/25
Date Analyzed:	08/29/24	Data File:	082844.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	2 d	22	119
Phenol-d6	20 d	38	124
Nitrobenzene-d5	57 d	10	198
2-Fluorobiphenyl	64 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	69 d	50	124

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.25	3-Nitroaniline	<25
Phenol	<1.2	Acenaphthene	0.062
Bis(2-chloroethyl) ether	<0.25	2,4-Dinitrophenol	<7.5 k
2-Chlorophenol	<2.5	Dibenzofuran	0.035
1,3-Dichlorobenzene	<0.25	2,4-Dinitrotoluene	<1.2 k
1,4-Dichlorobenzene	<0.25	4-Nitrophenol	<7.5
1,2-Dichlorobenzene	<0.25	Diethyl phthalate	<2.5
Benzyl alcohol	<2.5	Fluorene	0.077
2,2'-Oxybis(1-chloropropane)	<0.25	4-Chlorophenyl phenyl ether	<0.25
2-Methylphenol	<2.5	1,2-Diphenylhydrazine	<0.25
Hexachloroethane	<0.25	N-Nitrosodiphenylamine	0.28
N-Nitroso-di-n-propylamine	<0.25	4-Nitroaniline	<25
3-Methylphenol + 4-Methylphenol	<5	4,6-Dinitro-2-methylphenol	<7.5 k
Nitrobenzene	<0.25	4-Bromophenyl phenyl ether	<0.25
Isophorone	<0.25	Hexachlorobenzene	<0.25
2-Nitrophenol	<2.5	Pentachlorophenol	<1.2
2,4-Dimethylphenol	<2.5	Phenanthrene	0.30
Benzoic acid	<12	Anthracene	0.046
Bis(2-chloroethoxy)methane	<0.25	Carbazole	0.033
2,4-Dichlorophenol	<2.5	Di-n-butyl phthalate	<2.5
1,2,4-Trichlorobenzene	<0.25	Fluoranthene	0.34
Naphthalene	0.18	Pyrene	0.53
Hexachlorobutadiene	<0.25	Benzyl butyl phthalate	5.7
4-Chloroaniline	<25	3,3'-Dichlorobenzidine	<2.5
4-Chloro-3-methylphenol	<2.5	Benz(a)anthracene	0.27
2-Methylnaphthalene	0.38	Chrysene	0.46
1-Methylnaphthalene	0.24	Bis(2-ethylhexyl) phthalate	74 ve fc
Hexachlorocyclopentadiene	<0.75 j	Di-n-octyl phthalate	6.7
2,4,6-Trichlorophenol	<2.5	Benzo(a)pyrene	0.30
2,4,5-Trichlorophenol	<2.5	Benzo(b)fluoranthene	0.36
2-Chloronaphthalene	<0.25	Benzo(k)fluoranthene	0.13
2-Nitroaniline	<1.2	Indeno(1,2,3-cd)pyrene	0.17
Dimethyl phthalate	<2.5	Dibenz(a,h)anthracene	0.051
Acenaphthylene	<0.012	Benzo(g,h,i)perylene	0.30
2,6-Dinitrotoluene	<1.2		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-12-S-16.9	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	408228-09 1/250
Date Analyzed:	08/30/24	Data File:	083014.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	4 d	22	119
Phenol-d6	20 d	38	124
Nitrobenzene-d5	50 d	10	198
2-Fluorobiphenyl	60 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	70 d	50	124

Compounds:	Concentration mg/kg (ppm)
Bis(2-ethylhexyl) phthalate	100 fc

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-10 1/25
Date Analyzed:	08/21/24	Data File:	082018.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	1 d	22	119
Phenol-d6	15 d	38	124
Nitrobenzene-d5	75 d	10	198
2-Fluorobiphenyl	79 d	45	117
2,4,6-Tribromophenol	0 d	11	158
Terphenyl-d14	100 d	50	124

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.25	3-Nitroaniline	<25
Phenol	<1.2	Acenaphthene	0.058
Bis(2-chloroethyl) ether	<0.25	2,4-Dinitrophenol	<7.5
2-Chlorophenol	<2.5	Dibenzofuran	0.052
1,3-Dichlorobenzene	<0.25	2,4-Dinitrotoluene	<1.2
1,4-Dichlorobenzene	<0.25	4-Nitrophenol	<7.5
1,2-Dichlorobenzene	<0.25	Diethyl phthalate	<2.5
Benzyl alcohol	<2.5	Fluorene	0.092
2,2'-Oxybis(1-chloropropane)	<0.25	4-Chlorophenyl phenyl ether	<0.25
2-Methylphenol	<2.5	1,2-Diphenylhydrazine	<0.25
Hexachloroethane	<0.25	N-Nitrosodiphenylamine	<0.25
N-Nitroso-di-n-propylamine	<0.25	4-Nitroaniline	<25
3-Methylphenol + 4-Methylphenol	<5	4,6-Dinitro-2-methylphenol	<7.5
Nitrobenzene	<0.25	4-Bromophenyl phenyl ether	<0.25
Isophorone	<0.25	Hexachlorobenzene	<0.25
2-Nitrophenol	<2.5	Pentachlorophenol	<1.2
2,4-Dimethylphenol	<2.5	Phenanthrene	0.44
Benzoic acid	<12 ca	Anthracene	0.098
Bis(2-chloroethoxy)methane	<0.25	Carbazole	0.039
2,4-Dichlorophenol	<2.5	Di-n-butyl phthalate	<2.5
1,2,4-Trichlorobenzene	<0.25	Fluoranthene	0.36
Naphthalene	0.092	Pyrene	0.52
Hexachlorobutadiene	<0.25	Benzyl butyl phthalate	<2.5
4-Chloroaniline	<25	3,3'-Dichlorobenzidine	<2.5
4-Chloro-3-methylphenol	<2.5	Benz(a)anthracene	0.20
2-Methylnaphthalene	0.095	Chrysene	0.28
1-Methylnaphthalene	0.061	Bis(2-ethylhexyl) phthalate	11 fc
Hexachlorocyclopentadiene	<0.75	Di-n-octyl phthalate	<2.5
2,4,6-Trichlorophenol	<2.5	Benzo(a)pyrene	0.17
2,4,5-Trichlorophenol	<2.5	Benzo(b)fluoranthene	0.23
2-Chloronaphthalene	<0.25	Benzo(k)fluoranthene	0.086
2-Nitroaniline	<1.2	Indeno(1,2,3-cd)pyrene	0.093
Dimethyl phthalate	<2.5	Dibenz(a,h)anthracene	<0.025
Acenaphthylene	<0.012	Benzo(g,h,i)perylene	0.12
2,6-Dinitrotoluene	<1.2		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-13-S-7.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-11 1/5
Date Analyzed:	08/19/24	Data File:	081923.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	67	14	115
Phenol-d6	74	29	121
Nitrobenzene-d5	77	16	137
2-Fluorobiphenyl	85	46	122
2,4,6-Tribromophenol	62	17	154
Terphenyl-d14	85	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	<0.0025
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	<0.0025
Naphthalene	<0.005	Pyrene	<0.0025
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	<0.0025
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-14-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-12 1/25
Date Analyzed:	08/21/24	Data File:	082019.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	76 d	22	119
Phenol-d6	86 d	38	124
Nitrobenzene-d5	83 d	10	198
2-Fluorobiphenyl	84 d	45	117
2,4,6-Tribromophenol	90 d	11	158
Terphenyl-d14	105 d	50	124

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.25	3-Nitroaniline	<25
Phenol	<1.2	Acenaphthene	0.027
Bis(2-chloroethyl) ether	<0.25	2,4-Dinitrophenol	<7.5
2-Chlorophenol	<2.5	Dibenzofuran	0.013
1,3-Dichlorobenzene	<0.25	2,4-Dinitrotoluene	<1.2
1,4-Dichlorobenzene	<0.25	4-Nitrophenol	<7.5
1,2-Dichlorobenzene	<0.25	Diethyl phthalate	<2.5
Benzyl alcohol	<2.5	Fluorene	0.023
2,2'-Oxybis(1-chloropropane)	<0.25	4-Chlorophenyl phenyl ether	<0.25
2-Methylphenol	<2.5	1,2-Diphenylhydrazine	<0.25
Hexachloroethane	<0.25	N-Nitrosodiphenylamine	<0.25
N-Nitroso-di-n-propylamine	<0.25	4-Nitroaniline	<25
3-Methylphenol + 4-Methylphenol	<5	4,6-Dinitro-2-methylphenol	<7.5
Nitrobenzene	<0.25	4-Bromophenyl phenyl ether	<0.25
Isophorone	<0.25	Hexachlorobenzene	<0.25
2-Nitrophenol	<2.5	Pentachlorophenol	<1.2
2,4-Dimethylphenol	<2.5	Phenanthrene	0.18
Benzoic acid	<12 ca	Anthracene	0.23
Bis(2-chloroethoxy)methane	<0.25	Carbazole	0.031
2,4-Dichlorophenol	<2.5	Di-n-butyl phthalate	<2.5
1,2,4-Trichlorobenzene	<0.25	Fluoranthene	1.6
Naphthalene	<0.025	Pyrene	3.8
Hexachlorobutadiene	<0.25	Benzyl butyl phthalate	<2.5
4-Chloroaniline	<25	3,3'-Dichlorobenzidine	<2.5
4-Chloro-3-methylphenol	<2.5	Benz(a)anthracene	1.0
2-Methylnaphthalene	<0.012	Chrysene	1.9
1-Methylnaphthalene	<0.012	Bis(2-ethylhexyl) phthalate	<4
Hexachlorocyclopentadiene	<0.75	Di-n-octyl phthalate	<2.5
2,4,6-Trichlorophenol	<2.5	Benzo(a)pyrene	1.1
2,4,5-Trichlorophenol	<2.5	Benzo(b)fluoranthene	2.3
2-Chloronaphthalene	<0.25	Benzo(k)fluoranthene	0.75
2-Nitroaniline	<1.2	Indeno(1,2,3-cd)pyrene	0.49
Dimethyl phthalate	<2.5	Dibenz(a,h)anthracene	0.12
Acenaphthylene	0.036	Benzo(g,h,i)perylene	0.47
2,6-Dinitrotoluene	<1.2		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	TWA-SB-15-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-13 1/5
Date Analyzed:	08/20/24	Data File:	081924.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	78	14	115
Phenol-d6	85	29	121
Nitrobenzene-d5	87	16	137
2-Fluorobiphenyl	99	46	122
2,4,6-Tribromophenol	88	17	154
Terphenyl-d14	93	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	0.0029
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	0.0032
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	0.0051
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	0.030
Benzoic acid	<2.5	Anthracene	0.031
Bis(2-chloroethoxy)methane	<0.05	Carbazole	0.0072
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	0.067
Naphthalene	0.0072	Pyrene	0.057
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	0.071
2-Methylnaphthalene	<0.0025	Chrysene	0.18
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	0.11
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	0.21
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	0.071
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	0.073
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	0.015
Acenaphthylene	0.0087	Benzo(g,h,i)perylene	0.072 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	04-2039 mb 1/5
Date Analyzed:	08/19/24	Data File:	081914.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	82	14	115
Phenol-d6	91	29	121
Nitrobenzene-d5	96	16	137
2-Fluorobiphenyl	106	46	122
2,4,6-Tribromophenol	91	17	154
Terphenyl-d14	101	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05 k	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	<0.0025
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	<0.0025
Naphthalene	<0.005	Pyrene	<0.0025
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	<0.0025
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 ca	Di-n-octyl phthalate	<0.5 k
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 ca
2,6-Dinitrotoluene	<0.25		

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	04-2072 mb3 1/5
Date Analyzed:	08/27/24	Data File:	082715.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	68	14	115
Phenol-d6	78	29	121
Nitrobenzene-d5	83	16	137
2-Fluorobiphenyl	87	46	122
2,4,6-Tribromophenol	83	17	154
Terphenyl-d14	91	31	167

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
N-Nitrosodimethylamine	<0.05	3-Nitroaniline	<5
Phenol	<0.25	Acenaphthene	<0.0025
Bis(2-chloroethyl) ether	<0.05	2,4-Dinitrophenol	<1.5
2-Chlorophenol	<0.5	Dibenzofuran	<0.0025
1,3-Dichlorobenzene	<0.05	2,4-Dinitrotoluene	<0.25
1,4-Dichlorobenzene	<0.05	4-Nitrophenol	<1.5
1,2-Dichlorobenzene	<0.05	Diethyl phthalate	<0.5
Benzyl alcohol	<0.5	Fluorene	<0.0025
2,2'-Oxybis(1-chloropropane)	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Methylphenol	<0.5	1,2-Diphenylhydrazine	<0.05
Hexachloroethane	<0.05	N-Nitrosodiphenylamine	<0.05
N-Nitroso-di-n-propylamine	<0.05	4-Nitroaniline	<5
3-Methylphenol + 4-Methylphenol	<1	4,6-Dinitro-2-methylphenol	<1.5
Nitrobenzene	<0.05	4-Bromophenyl phenyl ether	<0.05
Isophorone	<0.05	Hexachlorobenzene	<0.05
2-Nitrophenol	<0.5	Pentachlorophenol	<0.25
2,4-Dimethylphenol	<0.5	Phenanthrene	<0.0025
Benzoic acid	<2.5	Anthracene	<0.0025
Bis(2-chloroethoxy)methane	<0.05	Carbazole	<0.0025
2,4-Dichlorophenol	<0.5	Di-n-butyl phthalate	<0.5
1,2,4-Trichlorobenzene	<0.05	Fluoranthene	<0.0025
Naphthalene	<0.005	Pyrene	<0.0025
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	3,3'-Dichlorobenzidine	<0.5
4-Chloro-3-methylphenol	<0.5	Benz(a)anthracene	<0.005
2-Methylnaphthalene	<0.0025	Chrysene	<0.0025
1-Methylnaphthalene	<0.0025	Bis(2-ethylhexyl) phthalate	<0.8
Hexachlorocyclopentadiene	<0.15 j	Di-n-octyl phthalate	<0.5
2,4,6-Trichlorophenol	<0.5	Benzo(a)pyrene	<0.0025
2,4,5-Trichlorophenol	<0.5	Benzo(b)fluoranthene	<0.0025
2-Chloronaphthalene	<0.05	Benzo(k)fluoranthene	<0.0025
2-Nitroaniline	<0.25	Indeno(1,2,3-cd)pyrene	<0.005 k
Dimethyl phthalate	<0.5	Dibenz(a,h)anthracene	<0.005 k
Acenaphthylene	<0.0025	Benzo(g,h,i)perylene	<0.005 k
2,6-Dinitrotoluene	<0.25		

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-09-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-01
Date Analyzed:	08/15/24	Data File:	408228-01.122
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.0
Cadmium	<0.2
Chromium	7.9
Copper	9.3
Lead	1.2
Mercury	<1
Nickel	9.3
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-09-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-01
Date Analyzed:	08/16/24	Data File:	408228-01.124
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Zinc	20

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-09-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-01 x5
Date Analyzed:	08/19/24	Data File:	408228-01 x5.074
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	59

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-16-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-02
Date Analyzed:	08/15/24	Data File:	408228-02.123
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.4
Cadmium	<0.2
Chromium	9.1
Copper	7.9
Lead	2.5
Mercury	<1
Nickel	4.4
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-16-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-02 x2
Date Analyzed:	08/16/24	Data File:	408228-02 x2.125
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Zinc	18

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-16-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-02 x5
Date Analyzed:	08/19/24	Data File:	408228-02 x5.075
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	60

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-10-S-6.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-03
Date Analyzed:	08/15/24	Data File:	408228-03.124
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.5
Cadmium	0.42
Chromium	17
Copper	16
Lead	11
Mercury	<1
Nickel	22
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-10-S-6.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-03 x5
Date Analyzed:	08/16/24	Data File:	408228-03 x5.126
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Zinc	55

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-10-S-6.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-03 x25
Date Analyzed:	08/19/24	Data File:	408228-03 x25.096
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	670

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-04
Date Analyzed:	08/15/24	Data File:	408228-04.125
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.7
Cadmium	5.6
Chromium	36
Copper	170
Mercury	<1
Nickel	45
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-04 x10
Date Analyzed:	08/16/24	Data File:	408228-04 x10.128
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	330
Zinc	1,100

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-04 x25
Date Analyzed:	08/19/24	Data File:	408228-04 x25.097
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	340

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-05
Date Analyzed:	08/20/24	Data File:	408228-05.050
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.4
Cadmium	0.42
Chromium	2.1
Copper	60
Lead	23
Manganese	18
Mercury	<1
Nickel	23
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-05 x5
Date Analyzed:	08/21/24	Data File:	408228-05 x5.185
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Zinc	160

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-16.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-06
Date Analyzed:	08/20/24	Data File:	408228-06.059
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.7
Cadmium	0.26
Chromium	11
Copper	28
Lead	3.7
Mercury	<1
Nickel	11
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-11-S-16.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-06 x5
Date Analyzed:	08/21/24	Data File:	408228-06 x5.186
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	140
Zinc	31

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-07
Date Analyzed:	08/15/24	Data File:	408228-07.126
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	14
Cadmium	13
Chromium	61
Copper	140
Mercury	<1
Nickel	80
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-07 x25
Date Analyzed:	08/16/24	Data File:	408228-07 x25.136
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	1,400
Manganese	600
Zinc	4,000

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-08
Date Analyzed:	08/15/24	Data File:	408228-08.132
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	12
Cadmium	11
Chromium	29
Mercury	<1
Nickel	55
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-08 x25
Date Analyzed:	08/16/24	Data File:	408228-08 x25.137
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Copper	3,700
Lead	690
Manganese	290
Zinc	1,400

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-16.9	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	408228-09
Date Analyzed:	08/28/24	Data File:	408228-09.144
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.9
Cadmium	5.3
Lead	350
Mercury	<1
Selenium	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-16.9	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	408228-09 x5
Date Analyzed:	08/30/24	Data File:	408228-09 x5.185
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	43
Copper	100
Manganese	330
Nickel	55
Zinc	1,000

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-10
Date Analyzed:	08/15/24	Data File:	408228-10.133
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	11
Cadmium	6.7
Chromium	21
Copper	66
Mercury	<1
Nickel	34
Selenium	<1
Zinc	600

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-10 x5
Date Analyzed:	08/16/24	Data File:	408228-10 x5.138
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	360
Manganese	210

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-13-S-7.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-11
Date Analyzed:	08/15/24	Data File:	408228-11.134
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.6
Cadmium	<0.2
Chromium	6.7
Copper	9.0
Lead	4.1
Mercury	<1
Nickel	5.3
Selenium	<1
Zinc	18

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-13-S-7.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-11 x5
Date Analyzed:	08/16/24	Data File:	408228-11 x5.139
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	52

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-14-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-12
Date Analyzed:	08/15/24	Data File:	408228-12.135
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	6.0
Cadmium	1.2
Chromium	19
Copper	36
Lead	77
Mercury	<1
Nickel	23
Selenium	<1
Zinc	160

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-14-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-12 x10
Date Analyzed:	08/16/24	Data File:	408228-12 x10.140
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	460

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-15-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-13
Date Analyzed:	08/15/24	Data File:	408228-13.136
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.1
Cadmium	0.23
Chromium	11
Copper	15
Lead	16
Mercury	<1
Nickel	9.8
Selenium	<1
Zinc	36

Analysis For Total Metals By EPA Method 6020B

Client ID:	TWA-SB-15-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	408228-13 x5
Date Analyzed:	08/16/24	Data File:	408228-13 x5.141
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Manganese	160

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	NA	Project:	TWAAFA M0615.20.014
Date Extracted:	08/15/24	Lab ID:	I4-676 mb
Date Analyzed:	08/15/24	Data File:	I4-676 mb.079
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<0.2
Chromium	<1 j
Copper	<5
Lead	<0.2
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	NA	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	I4-684 mb
Date Analyzed:	08/20/24	Data File:	I4-684 mb.044
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<0.2
Chromium	<1
Copper	<5
Lead	<0.2
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	NA	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	I4-707 mb2
Date Analyzed:	08/27/24	Data File:	I4-707 mb2.069
Matrix:	Soil	Instrument:	ICPMS3
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<0.2
Chromium	<0.5
Copper	<5
Lead	<0.2
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Zinc	<5

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-09-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-01 1/30
Date Analyzed:	08/19/24	Data File:	081915.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	90	41	139
Decachlorobiphenyl	135	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-16-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-02 1/30
Date Analyzed:	08/20/24	Data File:	082011.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	98	41	139
Decachlorobiphenyl	102	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-10-S-6.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-03 1/30
Date Analyzed:	08/20/24	Data File:	082012.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	83	41	139
Decachlorobiphenyl	85	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	0.13
Aroclor 1260	0.11
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-11-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-04 1/30
Date Analyzed:	08/20/24	Data File:	082013.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	74	41	139
Decachlorobiphenyl	68	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	0.23
Aroclor 1248	<0.02
Aroclor 1254	0.54
Aroclor 1260	0.38
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-11-S-6.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-05 1/30
Date Analyzed:	08/20/24	Data File:	082014.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	81	41	139
Decachlorobiphenyl	82	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.05
Aroclor 1248	<0.02
Aroclor 1254	0.26
Aroclor 1260	<0.09
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-11-S-16.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-06 1/30
Date Analyzed:	08/20/24	Data File:	082015.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	81	41	139
Decachlorobiphenyl	86	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-07 1/30
Date Analyzed:	08/20/24	Data File:	082016.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	83	41	139
Decachlorobiphenyl	89	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	1.4 ve
Aroclor 1248	<0.02
Aroclor 1254	3.5 ve
Aroclor 1260	2.2 ve
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-8.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/21/24	Lab ID:	408228-07 1/600
Date Analyzed:	08/21/24	Data File:	082108.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	100 d	41	139
Decachlorobiphenyl	120 d	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1242	1.8
Aroclor 1254	5.3
Aroclor 1260	3.3

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-08 1/30
Date Analyzed:	08/20/24	Data File:	082017.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	91	41	139
Decachlorobiphenyl	122	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	0.99 ve
Aroclor 1248	<0.02
Aroclor 1254	2.2 ve
Aroclor 1260	1.1 ve
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-9.0	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/21/24	Lab ID:	408228-08 1/600
Date Analyzed:	08/21/24	Data File:	082109.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	110 d	41	139
Decachlorobiphenyl	150 d	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1242	1.3
Aroclor 1254	3.3
Aroclor 1260	1.7

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-16.9	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	408228-09 1/30
Date Analyzed:	08/28/24	Data File:	082728.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	77	41	139
Decachlorobiphenyl	98	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	0.37
Aroclor 1248	<0.02
Aroclor 1254	1.3 ve
Aroclor 1260	1.8 ve
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-16.9	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	408228-09 1/300
Date Analyzed:	08/28/24	Data File:	082823.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	95 d	41	139
Decachlorobiphenyl	120 d	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1254	1.9
Aroclor 1260	2.6

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-10 1/30
Date Analyzed:	08/20/24	Data File:	082018.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	88	41	139
Decachlorobiphenyl	111	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	0.61
Aroclor 1248	<0.02
Aroclor 1254	1.0 ve
Aroclor 1260	2.0 ve
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-12-S-18.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/21/24	Lab ID:	408228-10 1/600
Date Analyzed:	08/21/24	Data File:	082110.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	110 d	41	139
Decachlorobiphenyl	160 d	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1254	1.6
Aroclor 1260	2.6

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-13-S-7.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-11 1/30
Date Analyzed:	08/20/24	Data File:	082019.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	88	41	139
Decachlorobiphenyl	84	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-14-S-1.5	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-12 1/30
Date Analyzed:	08/20/24	Data File:	082020.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	91	41	139
Decachlorobiphenyl	86	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	0.095
Aroclor 1260	0.11
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	TWA-SB-15-S-1.7	Client:	Maul Foster Alongi
Date Received:	08/13/24	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	408228-13 1/30
Date Analyzed:	08/20/24	Data File:	082021.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	70	41	139
Decachlorobiphenyl	66	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/19/24	Lab ID:	04-2041 mb 1/30
Date Analyzed:	08/19/24	Data File:	081913.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	97	41	139
Decachlorobiphenyl	104	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	TWAAFA M0615.20.014
Date Extracted:	08/27/24	Lab ID:	04-2073 mb3 1/30
Date Analyzed:	08/27/24	Data File:	082705.D
Matrix:	Soil	Instrument:	GC12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Tetrachlorometaxylene	92	41	139
Decachlorobiphenyl	104	48	145

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 408228-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	40	80	70-130

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 408228-05 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	40	87	70-130

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 408228-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	(Wet wt) Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	2,500	<25	108	116	64-136	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	2,500	108	78-121

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 408228-09 (Matrix Spike)

Analyte	Reporting Units	Spike Level	(Wet wt) Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	2,500	1,200	116	115	64-136	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	2,500	100	78-121

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 408253-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	10	<1	98	30-221
Chloromethane	ug/L (ppb)	10	<10	89	50-150
Vinyl chloride	ug/L (ppb)	10	<0.02	105	50-150
Bromomethane	ug/L (ppb)	10	<5	102	50-150
Chloroethane	ug/L (ppb)	10	<1	105	50-150
Trichlorofluoromethane	ug/L (ppb)	10	<1	99	50-150
Acetone	ug/L (ppb)	50	<50	32	18-161
1,1-Dichloroethene	ug/L (ppb)	10	<1	101	50-150
Hexane	ug/L (ppb)	10	<5	103	50-150
Methylene chloride	ug/L (ppb)	10	<5	97	50-150
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	<1	98	50-150
trans-1,2-Dichloroethene	ug/L (ppb)	10	<1	99	50-150
1,1-Dichloroethane	ug/L (ppb)	10	<1	102	50-150
2,2-Dichloropropane	ug/L (ppb)	10	<1	107	43-171
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	102	10-211
Chloroform	ug/L (ppb)	10	<1	96	50-150
2-Butanone (MEK)	ug/L (ppb)	50	<20	74	10-192
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	<0.2	104	50-150
1,1,1-Trichloroethane	ug/L (ppb)	10	<1	101	50-150
1,1-Dichloropropene	ug/L (ppb)	10	<1	99	50-150
Carbon tetrachloride	ug/L (ppb)	10	<0.5	97	50-150
Benzene	ug/L (ppb)	10	<0.35	105	50-150
Trichloroethene	ug/L (ppb)	10	<0.5	100	35-149
1,2-Dichloropropane	ug/L (ppb)	10	<1	95	50-150
Bromodichloromethane	ug/L (ppb)	10	<0.5	98	50-150
Dibromomethane	ug/L (ppb)	10	<1	97	50-150
4-Methyl-2-pentanone	ug/L (ppb)	50	<10	105	50-150
cis-1,3-Dichloropropene	ug/L (ppb)	10	<0.4	102	50-150
Toluene	ug/L (ppb)	10	<1	105	50-150
trans-1,3-Dichloropropene	ug/L (ppb)	10	<0.4	98	50-150
1,1,2-Trichloroethane	ug/L (ppb)	10	<0.5	105	50-150
2-Hexanone	ug/L (ppb)	50	<10	85	50-150
1,3-Dichloropropane	ug/L (ppb)	10	<1	103	50-150
Tetrachloroethene	ug/L (ppb)	10	<1	106	50-150
Dibromochloromethane	ug/L (ppb)	10	<0.5	99	50-150
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	<0.01	104	50-150
Chlorobenzene	ug/L (ppb)	10	<1	104	50-150
Ethylbenzene	ug/L (ppb)	10	<1	107	50-150
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	<1	100	50-150
m,p-Xylene	ug/L (ppb)	20	<2	104	50-150
o-Xylene	ug/L (ppb)	10	<1	103	50-150
Styrene	ug/L (ppb)	10	<1	99	50-150
Isopropylbenzene	ug/L (ppb)	10	<1	103	50-150
Bromoform	ug/L (ppb)	10	<5	93	50-150
n-Propylbenzene	ug/L (ppb)	10	<1	111	50-150
Bromobenzene	ug/L (ppb)	10	<1	108	50-150
1,3,5-Trimethylbenzene	ug/L (ppb)	10	<1	110	50-150
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	<0.2	116	50-150
1,2,3-Trichloropropane	ug/L (ppb)	10	<1	111	50-150
2-Chlorotoluene	ug/L (ppb)	10	<1	111	50-150
4-Chlorotoluene	ug/L (ppb)	10	<1	110	50-150
tert-Butylbenzene	ug/L (ppb)	10	<1	108	50-150
1,2,4-Trimethylbenzene	ug/L (ppb)	10	<1	107	50-150
sec-Butylbenzene	ug/L (ppb)	10	<1	109	50-150
p-Isopropyltoluene	ug/L (ppb)	10	<1	108	50-150
1,3-Dichlorobenzene	ug/L (ppb)	10	<1	111	50-150
1,4-Dichlorobenzene	ug/L (ppb)	10	<1	108	50-150
1,2-Dichlorobenzene	ug/L (ppb)	10	<1	105	50-150
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	<10	102	50-150
1,2,4-Trichlorobenzene	ug/L (ppb)	10	<1	99	50-150
Hexachlorobutadiene	ug/L (ppb)	10	<0.5	103	50-150
Naphthalene	ug/L (ppb)	10	<1	97	50-150
1,2,3-Trichlorobenzene	ug/L (ppb)	10	<1	95	50-150

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	92	89	46-206	3
Chloromethane	ug/L (ppb)	10	87	84	59-132	4
Vinyl chloride	ug/L (ppb)	10	97	96	64-142	1
Bromomethane	ug/L (ppb)	10	98	97	50-197	1
Chloroethane	ug/L (ppb)	10	98	105	70-130	7
Trichlorofluoromethane	ug/L (ppb)	10	89	88	51-159	1
Acetone	ug/L (ppb)	50	36	34	10-140	6
1,1-Dichloroethene	ug/L (ppb)	10	95	94	64-140	1
Hexane	ug/L (ppb)	10	92	92	54-136	0
Methylene chloride	ug/L (ppb)	10	93	89	43-134	4
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	96	94	70-130	2
trans-1,2-Dichloroethene	ug/L (ppb)	10	95	92	70-130	3
1,1-Dichloroethane	ug/L (ppb)	10	96	93	70-130	3
2,2-Dichloropropane	ug/L (ppb)	10	100	99	64-148	1
cis-1,2-Dichloroethene	ug/L (ppb)	10	96	95	70-130	1
Chloroform	ug/L (ppb)	10	90	88	70-130	2
2-Butanone (MEK)	ug/L (ppb)	50	60	64	47-112	6
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	97	95	70-130	2
1,1,1-Trichloroethane	ug/L (ppb)	10	95	94	70-130	1
1,1-Dichloropropene	ug/L (ppb)	10	93	89	70-130	4
Carbon tetrachloride	ug/L (ppb)	10	93	90	70-130	3
Benzene	ug/L (ppb)	10	98	96	70-130	2
Trichloroethene	ug/L (ppb)	10	91	91	70-130	0
1,2-Dichloropropane	ug/L (ppb)	10	90	88	70-130	2
Bromodichloromethane	ug/L (ppb)	10	91	89	70-130	2
Dibromomethane	ug/L (ppb)	10	91	90	70-130	1
4-Methyl-2-pentanone	ug/L (ppb)	50	91	91	68-130	0
cis-1,3-Dichloropropene	ug/L (ppb)	10	91	90	69-131	1
Toluene	ug/L (ppb)	10	97	96	70-130	1
trans-1,3-Dichloropropene	ug/L (ppb)	10	92	92	70-130	0
1,1,2-Trichloroethane	ug/L (ppb)	10	97	96	70-130	1
2-Hexanone	ug/L (ppb)	50	78	79	45-138	1
1,3-Dichloropropane	ug/L (ppb)	10	96	91	70-130	5
Tetrachloroethene	ug/L (ppb)	10	97	96	70-130	1
Dibromochloromethane	ug/L (ppb)	10	92	90	60-148	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	97	96	70-130	1
Chlorobenzene	ug/L (ppb)	10	96	94	70-130	2
Ethylbenzene	ug/L (ppb)	10	99	98	70-130	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	95	95	70-130	0
m,p-Xylene	ug/L (ppb)	20	96	95	70-130	1
o-Xylene	ug/L (ppb)	10	95	94	70-130	1
Styrene	ug/L (ppb)	10	93	91	70-130	2
Isopropylbenzene	ug/L (ppb)	10	96	94	70-130	2
Bromoform	ug/L (ppb)	10	92	86	69-138	7
n-Propylbenzene	ug/L (ppb)	10	102	98	70-130	4
Bromobenzene	ug/L (ppb)	10	99	97	70-130	2
1,3,5-Trimethylbenzene	ug/L (ppb)	10	99	100	70-130	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	105	104	70-130	1
1,2,3-Trichloropropane	ug/L (ppb)	10	102	101	70-130	1
2-Chlorotoluene	ug/L (ppb)	10	99	99	70-130	0
4-Chlorotoluene	ug/L (ppb)	10	99	96	70-130	3
tert-Butylbenzene	ug/L (ppb)	10	98	98	70-130	0
1,2,4-Trimethylbenzene	ug/L (ppb)	10	98	97	70-130	1
sec-Butylbenzene	ug/L (ppb)	10	98	98	70-130	0
p-Isopropyltoluene	ug/L (ppb)	10	100	99	70-130	1
1,3-Dichlorobenzene	ug/L (ppb)	10	100	99	70-130	1
1,4-Dichlorobenzene	ug/L (ppb)	10	99	97	70-130	2
1,2-Dichlorobenzene	ug/L (ppb)	10	98	95	70-130	3
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	93	93	70-130	0
1,2,4-Trichlorobenzene	ug/L (ppb)	10	92	93	70-130	1
Hexachlorobutadiene	ug/L (ppb)	10	96	94	70-130	2
Naphthalene	ug/L (ppb)	10	94	94	70-130	0
1,2,3-Trichlorobenzene	ug/L (ppb)	10	93	94	70-130	1

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 408228-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2	<0.5	48	41	10-142	16
Chloromethane	mg/kg (ppm)	2	<0.5	73	68	10-126	7
Vinyl chloride	mg/kg (ppm)	2	<0.05	74	70	10-138	6
Bromomethane	mg/kg (ppm)	2	<0.5	86	85	10-163	1
Chloroethane	mg/kg (ppm)	2	<0.5	70	85	10-176	19
Trichlorofluoromethane	mg/kg (ppm)	2	<0.5	86	78	10-176	10
Acetone	mg/kg (ppm)	10	<5	58	86	10-163	39 vo
1,1-Dichloroethene	mg/kg (ppm)	2	<0.05	87	79	10-160	10
Hexane	mg/kg (ppm)	2	<0.25	75	81	10-137	8
Methylene chloride	mg/kg (ppm)	2	<0.5	98	85	10-156	14
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2	<0.05	93	87	21-145	7
trans-1,2-Dichloroethene	mg/kg (ppm)	2	<0.05	88	83	14-137	6
1,1-Dichloroethane	mg/kg (ppm)	2	<0.05	84	83	19-140	1
2,2-Dichloropropane	mg/kg (ppm)	2	<0.05	96	90	10-158	6
cis-1,2-Dichloroethene	mg/kg (ppm)	2	<0.05	90	83	25-135	8
Chloroform	mg/kg (ppm)	2	<0.05	88	84	21-145	5
2-Butanone (MEK)	mg/kg (ppm)	10	<1	73	86	19-147	16
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2	<0.05	86	87	12-160	1
1,1,1-Trichloroethane	mg/kg (ppm)	2	<0.05	90	82	10-156	9
1,1-Dichloropropene	mg/kg (ppm)	2	<0.05	89	89	17-140	0
Carbon tetrachloride	mg/kg (ppm)	2	<0.05	86	82	9-164	5
Benzene	mg/kg (ppm)	2	<0.03	86	88	29-129	2
Trichloroethene	mg/kg (ppm)	2	<0.02	76	79	21-139	4
1,2-Dichloropropane	mg/kg (ppm)	2	<0.05	82	87	30-135	6
Bromodichloromethane	mg/kg (ppm)	2	<0.05	78	81	23-155	4
Dibromomethane	mg/kg (ppm)	2	<0.05	86	88	23-145	2
4-Methyl-2-pentanone	mg/kg (ppm)	10	<1	87	92	24-155	6
cis-1,3-Dichloropropene	mg/kg (ppm)	2	<0.05	81	92	28-144	13
Toluene	mg/kg (ppm)	2	<0.05	79	83	35-130	5
trans-1,3-Dichloropropene	mg/kg (ppm)	2	<0.05	77	87	26-149	12
1,1,2-Trichloroethane	mg/kg (ppm)	2	<0.05	77	86	10-205	11
2-Hexanone	mg/kg (ppm)	10	<1	71	87	15-166	20
1,3-Dichloropropane	mg/kg (ppm)	2	<0.05	83	90	31-137	8
Tetrachloroethene	mg/kg (ppm)	2	<0.025	81	86	20-133	6
Dibromochloromethane	mg/kg (ppm)	2	<0.05	75	78	28-150	4
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2	<0.05	79	86	28-142	8
Chlorobenzene	mg/kg (ppm)	2	<0.05	82	84	32-129	2
Ethylbenzene	mg/kg (ppm)	2	<0.05	81	82	32-137	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2	<0.05	81	76	31-143	6
m,p-Xylene	mg/kg (ppm)	4	<0.1	88	84	34-136	5
o-Xylene	mg/kg (ppm)	2	<0.05	89	84	33-134	6
Styrene	mg/kg (ppm)	2	<0.05	81	84	35-137	4
Isopropylbenzene	mg/kg (ppm)	2	<0.05	88	82	31-142	7
Bromoform	mg/kg (ppm)	2	<0.05	73	76	21-156	4
n-Propylbenzene	mg/kg (ppm)	2	<0.05	87	87	23-146	0
Bromobenzene	mg/kg (ppm)	2	<0.05	85	88	34-130	3
1,3,5-Trimethylbenzene	mg/kg (ppm)	2	<0.05	91	86	18-149	6
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2	<0.05	91	89	28-140	2
1,2,3-Trichloropropane	mg/kg (ppm)	2	<0.05	88	91	25-144	3
2-Chlorotoluene	mg/kg (ppm)	2	<0.05	84	85	31-134	1
4-Chlorotoluene	mg/kg (ppm)	2	<0.05	79	83	31-136	5
tert-Butylbenzene	mg/kg (ppm)	2	<0.05	93	89	30-137	4
1,2,4-Trimethylbenzene	mg/kg (ppm)	2	<0.05	89	85	10-182	5
sec-Butylbenzene	mg/kg (ppm)	2	<0.05	93	88	23-145	6
p-Isopropyltoluene	mg/kg (ppm)	2	<0.05	89	85	21-149	5
1,3-Dichlorobenzene	mg/kg (ppm)	2	<0.05	82	86	30-131	5
1,4-Dichlorobenzene	mg/kg (ppm)	2	<0.05	79	83	29-129	5
1,2-Dichlorobenzene	mg/kg (ppm)	2	<0.05	88	87	31-132	1
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2	<0.5	75	71	11-161	5
1,2,4-Trichlorobenzene	mg/kg (ppm)	2	<0.25	80	80	22-142	0
Hexachlorobutadiene	mg/kg (ppm)	2	<0.25	82	85	10-142	4
Naphthalene	mg/kg (ppm)	2	<0.05	77	78	14-157	1
1,2,3-Trichlorobenzene	mg/kg (ppm)	2	<0.25	82	81	20-144	1

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2	62	10-146
Chloromethane	mg/kg (ppm)	2	76	27-133
Vinyl chloride	mg/kg (ppm)	2	75	22-139
Bromomethane	mg/kg (ppm)	2	92	10-201
Chloroethane	mg/kg (ppm)	2	72	10-163
Trichlorofluoromethane	mg/kg (ppm)	2	95	10-196
Acetone	mg/kg (ppm)	10	73	52-141
1,1-Dichloroethene	mg/kg (ppm)	2	88	47-128
Hexane	mg/kg (ppm)	2	86	43-142
Methylene chloride	mg/kg (ppm)	2	92	10-184
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2	88	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2	87	64-132
1,1-Dichloroethane	mg/kg (ppm)	2	85	64-135
2,2-Dichloropropane	mg/kg (ppm)	2	94	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2	83	64-135
Chloroform	mg/kg (ppm)	2	86	61-139
2-Butanone (MEK)	mg/kg (ppm)	10	76	30-197
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2	85	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2	85	62-131
1,1-Dichloropropene	mg/kg (ppm)	2	89	64-136
Carbon tetrachloride	mg/kg (ppm)	2	82	60-139
Benzene	mg/kg (ppm)	2	84	65-136
Trichloroethene	mg/kg (ppm)	2	78	63-139
1,2-Dichloropropane	mg/kg (ppm)	2	85	61-145
Bromodichloromethane	mg/kg (ppm)	2	78	57-126
Dibromomethane	mg/kg (ppm)	2	87	62-123
4-Methyl-2-pentanone	mg/kg (ppm)	10	85	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2	83	65-143
Toluene	mg/kg (ppm)	2	79	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2	79	65-131
1,1,2-Trichloroethane	mg/kg (ppm)	2	77	62-131
2-Hexanone	mg/kg (ppm)	10	75	33-152
1,3-Dichloropropane	mg/kg (ppm)	2	86	67-128
Tetrachloroethene	mg/kg (ppm)	2	83	68-128
Dibromochloromethane	mg/kg (ppm)	2	76	55-121
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2	81	66-129
Chlorobenzene	mg/kg (ppm)	2	84	67-128
Ethylbenzene	mg/kg (ppm)	2	82	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2	79	64-121
m,p-Xylene	mg/kg (ppm)	4	87	68-128
o-Xylene	mg/kg (ppm)	2	86	67-129
Styrene	mg/kg (ppm)	2	83	67-129
Isopropylbenzene	mg/kg (ppm)	2	85	68-128
Bromoform	mg/kg (ppm)	2	73	56-132
n-Propylbenzene	mg/kg (ppm)	2	88	68-129
Bromobenzene	mg/kg (ppm)	2	87	69-128
1,3,5-Trimethylbenzene	mg/kg (ppm)	2	92	69-129
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2	90	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2	89	61-137
2-Chlorotoluene	mg/kg (ppm)	2	86	69-128
4-Chlorotoluene	mg/kg (ppm)	2	81	67-127
tert-Butylbenzene	mg/kg (ppm)	2	93	69-129
1,2,4-Trimethylbenzene	mg/kg (ppm)	2	88	69-128
sec-Butylbenzene	mg/kg (ppm)	2	94	69-130
p-Isopropyltoluene	mg/kg (ppm)	2	90	69-130
1,3-Dichlorobenzene	mg/kg (ppm)	2	82	69-127
1,4-Dichlorobenzene	mg/kg (ppm)	2	82	68-126
1,2-Dichlorobenzene	mg/kg (ppm)	2	86	69-127
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2	76	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2	78	64-135
Hexachlorobutadiene	mg/kg (ppm)	2	85	50-153
Naphthalene	mg/kg (ppm)	2	76	62-128
1,2,3-Trichlorobenzene	mg/kg (ppm)	2	80	61-126

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 408251-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2	<0.5	57	59	10-142	3
Chloromethane	mg/kg (ppm)	2	<0.5	73	76	10-126	4
Vinyl chloride	mg/kg (ppm)	2	<0.05	78	80	10-138	3
Bromomethane	mg/kg (ppm)	2	<0.5	70	76	10-163	8
Chloroethane	mg/kg (ppm)	2	<0.5	53	57	10-176	7
Trichlorofluoromethane	mg/kg (ppm)	2	<0.5	78	78	10-176	0
Acetone	mg/kg (ppm)	10	<5	84	111	10-163	28 vo
1,1-Dichloroethene	mg/kg (ppm)	2	<0.05	88	92	10-160	4
Hexane	mg/kg (ppm)	2	<0.25	86	89	10-137	3
Methylene chloride	mg/kg (ppm)	2	<0.5	93	98	10-156	5
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2	<0.05	89	94	21-145	5
trans-1,2-Dichloroethene	mg/kg (ppm)	2	<0.05	91	94	14-137	3
1,1-Dichloroethane	mg/kg (ppm)	2	<0.05	89	92	19-140	3
2,2-Dichloropropane	mg/kg (ppm)	2	<0.05	93	91	10-158	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2	<0.05	90	90	25-135	0
Chloroform	mg/kg (ppm)	2	<0.05	91	94	21-145	3
2-Butanone (MEK)	mg/kg (ppm)	10	<1	85	109	19-147	25 vo
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2	<0.05	87	92	12-160	6
1,1,1-Trichloroethane	mg/kg (ppm)	2	<0.05	88	92	10-156	4
1,1-Dichloropropene	mg/kg (ppm)	2	<0.05	87	93	17-140	7
Carbon tetrachloride	mg/kg (ppm)	2	<0.05	88	94	9-164	7
Benzene	mg/kg (ppm)	2	<0.03	89	93	29-129	4
Trichloroethene	mg/kg (ppm)	2	<0.02	90	96	21-139	6
1,2-Dichloropropane	mg/kg (ppm)	2	<0.05	88	96	30-135	9
Bromodichloromethane	mg/kg (ppm)	2	<0.05	90	90	23-155	0
Dibromomethane	mg/kg (ppm)	2	<0.05	84	93	23-145	10
4-Methyl-2-pentanone	mg/kg (ppm)	10	<1	88	97	24-155	10
cis-1,3-Dichloropropene	mg/kg (ppm)	2	<0.05	87	94	28-144	8
Toluene	mg/kg (ppm)	2	<0.05	88	92	35-130	4
trans-1,3-Dichloropropene	mg/kg (ppm)	2	<0.05	90	97	26-149	7
1,1,2-Trichloroethane	mg/kg (ppm)	2	<0.05	86	95	10-205	10
2-Hexanone	mg/kg (ppm)	10	<1	90	110	15-166	20
1,3-Dichloropropane	mg/kg (ppm)	2	<0.05	85	93	31-137	9
Tetrachloroethene	mg/kg (ppm)	2	<0.025	91	91	20-133	0
Dibromochloromethane	mg/kg (ppm)	2	<0.05	88	95	28-150	8
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2	<0.05	89	98	28-142	10
Chlorobenzene	mg/kg (ppm)	2	<0.05	89	94	32-129	5
Ethylbenzene	mg/kg (ppm)	2	<0.05	90	93	32-137	3
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2	<0.05	88	93	31-143	6
m,p-Xylene	mg/kg (ppm)	4	<0.1	93	95	34-136	2
o-Xylene	mg/kg (ppm)	2	<0.05	90	95	33-134	5
Styrene	mg/kg (ppm)	2	<0.05	89	92	35-137	3
Isopropylbenzene	mg/kg (ppm)	2	<0.05	94	96	31-142	2
Bromoform	mg/kg (ppm)	2	<0.05	86	93	21-156	8
n-Propylbenzene	mg/kg (ppm)	2	<0.05	97	93	23-146	4
Bromobenzene	mg/kg (ppm)	2	<0.05	93	92	34-130	1
1,3,5-Trimethylbenzene	mg/kg (ppm)	2	<0.05	97	93	18-149	4
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2	<0.05	97	96	28-140	1
1,2,3-Trichloropropane	mg/kg (ppm)	2	<0.05	93	94	25-144	1
2-Chlorotoluene	mg/kg (ppm)	2	<0.05	94	91	31-134	3
4-Chlorotoluene	mg/kg (ppm)	2	<0.05	95	91	31-136	4
tert-Butylbenzene	mg/kg (ppm)	2	<0.05	98	95	30-137	3
1,2,4-Trimethylbenzene	mg/kg (ppm)	2	<0.05	94	92	10-182	2
sec-Butylbenzene	mg/kg (ppm)	2	<0.05	97	94	23-145	3
p-Isopropyltoluene	mg/kg (ppm)	2	<0.05	101	95	21-149	6
1,3-Dichlorobenzene	mg/kg (ppm)	2	<0.05	94	94	30-131	0
1,4-Dichlorobenzene	mg/kg (ppm)	2	<0.05	94	93	29-129	1
1,2-Dichlorobenzene	mg/kg (ppm)	2	<0.05	94	91	31-132	3
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2	<0.5	90	90	11-161	0
1,2,4-Trichlorobenzene	mg/kg (ppm)	2	<0.25	94	93	22-142	1
Hexachlorobutadiene	mg/kg (ppm)	2	<0.25	102	98	10-142	4
Naphthalene	mg/kg (ppm)	2	<0.05	91	91	14-157	0
1,2,3-Trichlorobenzene	mg/kg (ppm)	2	<0.25	91	88	20-144	3

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2	79	10-146
Chloromethane	mg/kg (ppm)	2	84	27-133
Vinyl chloride	mg/kg (ppm)	2	87	22-139
Bromomethane	mg/kg (ppm)	2	85	10-201
Chloroethane	mg/kg (ppm)	2	64	10-163
Trichlorofluoromethane	mg/kg (ppm)	2	86	10-196
Acetone	mg/kg (ppm)	10	101	52-141
1,1-Dichloroethene	mg/kg (ppm)	2	98	47-128
Hexane	mg/kg (ppm)	2	100	43-142
Methylene chloride	mg/kg (ppm)	2	112	10-184
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2	101	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2	108	64-132
1,1-Dichloroethane	mg/kg (ppm)	2	101	64-135
2,2-Dichloropropane	mg/kg (ppm)	2	110	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2	100	64-135
Chloroform	mg/kg (ppm)	2	100	61-139
2-Butanone (MEK)	mg/kg (ppm)	10	98	30-197
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2	98	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2	102	62-131
1,1-Dichloropropene	mg/kg (ppm)	2	101	64-136
Carbon tetrachloride	mg/kg (ppm)	2	100	60-139
Benzene	mg/kg (ppm)	2	100	65-136
Trichloroethene	mg/kg (ppm)	2	99	63-139
1,2-Dichloropropane	mg/kg (ppm)	2	97	61-145
Bromodichloromethane	mg/kg (ppm)	2	102	57-126
Dibromomethane	mg/kg (ppm)	2	96	62-123
4-Methyl-2-pentanone	mg/kg (ppm)	10	102	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2	97	65-143
Toluene	mg/kg (ppm)	2	90	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2	94	65-131
1,1,2-Trichloroethane	mg/kg (ppm)	2	90	62-131
2-Hexanone	mg/kg (ppm)	10	93	33-152
1,3-Dichloropropane	mg/kg (ppm)	2	91	67-128
Tetrachloroethene	mg/kg (ppm)	2	93	68-128
Dibromochloromethane	mg/kg (ppm)	2	95	55-121
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2	94	66-129
Chlorobenzene	mg/kg (ppm)	2	92	67-128
Ethylbenzene	mg/kg (ppm)	2	93	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2	96	64-121
m,p-Xylene	mg/kg (ppm)	4	96	68-128
o-Xylene	mg/kg (ppm)	2	93	67-129
Styrene	mg/kg (ppm)	2	91	67-129
Isopropylbenzene	mg/kg (ppm)	2	97	68-128
Bromoform	mg/kg (ppm)	2	95	56-132
n-Propylbenzene	mg/kg (ppm)	2	102	68-129
Bromobenzene	mg/kg (ppm)	2	99	69-128
1,3,5-Trimethylbenzene	mg/kg (ppm)	2	102	69-129
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2	100	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2	103	61-137
2-Chlorotoluene	mg/kg (ppm)	2	100	69-128
4-Chlorotoluene	mg/kg (ppm)	2	98	67-127
tert-Butylbenzene	mg/kg (ppm)	2	107	69-129
1,2,4-Trimethylbenzene	mg/kg (ppm)	2	100	69-128
sec-Butylbenzene	mg/kg (ppm)	2	104	69-130
p-Isopropyltoluene	mg/kg (ppm)	2	106	69-130
1,3-Dichlorobenzene	mg/kg (ppm)	2	99	69-127
1,4-Dichlorobenzene	mg/kg (ppm)	2	98	68-126
1,2-Dichlorobenzene	mg/kg (ppm)	2	100	69-127
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2	99	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2	99	64-135
Hexachlorobutadiene	mg/kg (ppm)	2	102	50-153
Naphthalene	mg/kg (ppm)	2	100	62-128
1,2,3-Trichlorobenzene	mg/kg (ppm)	2	100	61-126

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 408228-01 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
N-Nitrosodimethylamine	mg/kg (ppm)	0.83	<0.05	86	91	50-150	6
Phenol	mg/kg (ppm)	0.83	<0.25	75	82	50-150	9
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.83	<0.05	77	86	50-150	11
2-Chlorophenol	mg/kg (ppm)	0.83	<0.5	75	83	50-150	10
1,3-Dichlorobenzene	mg/kg (ppm)	0.83	<0.05	71	79	36-107	11
1,4-Dichlorobenzene	mg/kg (ppm)	0.83	<0.05	71	78	37-106	9
1,2-Dichlorobenzene	mg/kg (ppm)	0.83	<0.05	72	80	39-106	11
Benzyl alcohol	mg/kg (ppm)	4.2	<0.5	73	80	50-150	9
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.83	<0.05	76	85	50-150	11
2-Methylphenol	mg/kg (ppm)	0.83	<0.5	77	85	50-150	10
Hexachloroethane	mg/kg (ppm)	0.83	<0.05	72	79	19-129	9
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.83	<0.05	81	90	50-150	11
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.83	<1	79	86	50-150	8
Nitrobenzene	mg/kg (ppm)	0.83	<0.05	74	82	50-150	10
Isophorone	mg/kg (ppm)	0.83	<0.05	97	110	16-156	13
2-Nitrophenol	mg/kg (ppm)	0.83	<0.5	74	83	50-150	11
2,4-Dimethylphenol	mg/kg (ppm)	0.83	<0.5	79	85	35-117	7
Benzoic acid	mg/kg (ppm)	2.5	<2.5	58	64	10-105	10
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.83	<0.05	78	85	50-150	9
2,4-Dichlorophenol	mg/kg (ppm)	0.83	<0.5	79	86	50-150	8
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.83	<0.05	76	84	50-150	10
Naphthalene	mg/kg (ppm)	0.83	<0.005	74	82	50-150	10
Hexachlorobutadiene	mg/kg (ppm)	0.83	<0.05	69	78	39-106	12
4-Chloroaniline	mg/kg (ppm)	6.8	<5	69	75	40-101	8
4-Chloro-3-methylphenol	mg/kg (ppm)	0.83	<0.5	80	86	50-150	7
2-Methylnaphthalene	mg/kg (ppm)	0.83	<0.0025	73	81	50-150	10
1-Methylnaphthalene	mg/kg (ppm)	0.83	<0.0025	72	80	50-150	11
Hexachlorocyclopentadiene	mg/kg (ppm)	0.83	<0.15	50	57	27-127	13
2,4,6-Trichlorophenol	mg/kg (ppm)	0.83	<0.5	92	96	35-130	4
2,4,5-Trichlorophenol	mg/kg (ppm)	0.83	<0.5	84	89	43-126	6
2-Chloronaphthalene	mg/kg (ppm)	0.83	<0.05	82	88	50-150	7
2-Nitroaniline	mg/kg (ppm)	4.2	<0.25	74	75	50-150	1
Dimethyl phthalate	mg/kg (ppm)	0.83	<0.5	104	90	50-150	14
Acenaphthylene	mg/kg (ppm)	0.83	<0.0025	81	86	50-150	6
2,6-Dinitrotoluene	mg/kg (ppm)	0.83	<0.25	93	98	50-150	5
3-Nitroaniline	mg/kg (ppm)	4.2	<5	86	86	50-150	0
Acenaphthene	mg/kg (ppm)	0.83	<0.0025	83	87	50-150	5
2,4-Dinitrophenol	mg/kg (ppm)	1.7	<1.5	84	89	10-146	6
Dibenzofuran	mg/kg (ppm)	0.83	<0.0025	81	85	50-150	5
2,4-Dinitrotoluene	mg/kg (ppm)	0.83	<0.25	84	87	44-141	4
4-Nitrophenol	mg/kg (ppm)	1.7	<1.5	95	101	33-142	6
Diethyl phthalate	mg/kg (ppm)	0.83	<0.5	82	85	50-150	4
Fluorene	mg/kg (ppm)	0.83	<0.0025	80	84	50-150	5
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.83	<0.05	84	87	50-150	4
1,2-Diphenylhydrazine	mg/kg (ppm)	0.83	<0.05	79	83	50-150	5
N-Nitrosodiphenylamine	mg/kg (ppm)	0.83	<0.05	88	97	50-150	10
4-Nitroaniline	mg/kg (ppm)	4.2	<5	87	94	50-150	8
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.83	<1.5	92	106	33-155	14
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.83	<0.05	88	96	50-150	9
Hexachlorobenzene	mg/kg (ppm)	0.83	<0.05	83	91	50-150	9
Pentachlorophenol	mg/kg (ppm)	0.83	<0.25	103	116	15-159	12
Phenanthrene	mg/kg (ppm)	0.83	<0.0025	84	91	10-170	8
Anthracene	mg/kg (ppm)	0.83	<0.0025	81	88	37-139	8
Carbazole	mg/kg (ppm)	0.83	<0.0025	86	94	50-150	9
Di-n-butyl phthalate	mg/kg (ppm)	0.83	<0.5	85	92	50-150	8
Fluoranthene	mg/kg (ppm)	0.83	<0.0025	84	92	10-203	9
Pyrene	mg/kg (ppm)	0.83	<0.0025	78	83	10-208	6
Benzyl butyl phthalate	mg/kg (ppm)	0.83	<0.5	82	88	50-150	7
3,3'-Dichlorobenzidine	mg/kg (ppm)	1.3	<0.5	87	94	10-119	8
Benz(a)anthracene	mg/kg (ppm)	0.83	<0.005	99	106	37-146	7
Chrysene	mg/kg (ppm)	0.83	<0.0025	81	87	36-144	7
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.83	<0.8	87	93	50-150	7
Di-n-octyl phthalate	mg/kg (ppm)	0.83	<0.5	116	128	10-243	10
Benzo(a)pyrene	mg/kg (ppm)	0.83	<0.0025	85	92	40-150	8
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	<0.0025	91	98	45-157	7
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	<0.0025	89	97	50-150	9
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	<0.005	65	68	24-145	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	<0.005	66	68	31-137	3
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	<0.03	56	56	14-141	0

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
N-Nitrosodimethylamine	mg/kg (ppm)	0.83	89	55-109
Phenol	mg/kg (ppm)	0.83	89	57-113
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.83	92	55-108
2-Chlorophenol	mg/kg (ppm)	0.83	88	60-104
1,3-Dichlorobenzene	mg/kg (ppm)	0.83	84	54-103
1,4-Dichlorobenzene	mg/kg (ppm)	0.83	84	54-102
1,2-Dichlorobenzene	mg/kg (ppm)	0.83	85	55-103
Benzyl alcohol	mg/kg (ppm)	4.2	87	36-147
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.83	92	56-109
2-Methylphenol	mg/kg (ppm)	0.83	91	62-107
Hexachloroethane	mg/kg (ppm)	0.83	87	54-105
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.83	100	64-112
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.83	94	63-110
Nitrobenzene	mg/kg (ppm)	0.83	85	55-111
Isophorone	mg/kg (ppm)	0.83	93	52-127
2-Nitrophenol	mg/kg (ppm)	0.83	85	53-122
2,4-Dimethylphenol	mg/kg (ppm)	0.83	86	31-105
Benzoic acid	mg/kg (ppm)	2.5	63	38-99
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.83	90	63-112
2,4-Dichlorophenol	mg/kg (ppm)	0.83	89	62-112
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.83	86	59-105
Naphthalene	mg/kg (ppm)	0.83	85	59-105
Hexachlorobutadiene	mg/kg (ppm)	0.83	79	54-108
4-Chloroaniline	mg/kg (ppm)	6.8	75	36-111
4-Chloro-3-methylphenol	mg/kg (ppm)	0.83	93	63-116
2-Methylnaphthalene	mg/kg (ppm)	0.83	89	62-108
1-Methylnaphthalene	mg/kg (ppm)	0.83	88	62-108
Hexachlorocyclopentadiene	mg/kg (ppm)	0.83	75	48-123
2,4,6-Trichlorophenol	mg/kg (ppm)	0.83	94	61-114
2,4,5-Trichlorophenol	mg/kg (ppm)	0.83	93	64-121
2-Chloronaphthalene	mg/kg (ppm)	0.83	92	62-112
2-Nitroaniline	mg/kg (ppm)	4.2	76	30-179
Dimethyl phthalate	mg/kg (ppm)	0.83	105	63-124
Acenaphthylene	mg/kg (ppm)	0.83	96	61-111
2,6-Dinitrotoluene	mg/kg (ppm)	0.83	98	63-131
3-Nitroaniline	mg/kg (ppm)	4.2	94	57-114
Acenaphthene	mg/kg (ppm)	0.83	92	61-110
2,4-Dinitrophenol	mg/kg (ppm)	1.7	95	51-143
Dibenzofuran	mg/kg (ppm)	0.83	94	65-118
2,4-Dinitrotoluene	mg/kg (ppm)	0.83	98	47-146
4-Nitrophenol	mg/kg (ppm)	1.7	99	63-127
Diethyl phthalate	mg/kg (ppm)	0.83	96	63-124
Fluorene	mg/kg (ppm)	0.83	95	62-114
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.83	93	61-116
1,2-Diphenylhydrazine	mg/kg (ppm)	0.83	97	60-112
N-Nitrosodiphenylamine	mg/kg (ppm)	0.83	93	64-116
4-Nitroaniline	mg/kg (ppm)	4.2	87	63-117
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.83	103	59-152
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.83	92	66-118
Hexachlorobenzene	mg/kg (ppm)	0.83	92	57-115
Pentachlorophenol	mg/kg (ppm)	0.83	109	56-130
Phenanthrene	mg/kg (ppm)	0.83	93	64-112
Anthracene	mg/kg (ppm)	0.83	92	63-111
Carbazole	mg/kg (ppm)	0.83	97	68-120
Di-n-butyl phthalate	mg/kg (ppm)	0.83	98	52-130
Fluoranthene	mg/kg (ppm)	0.83	97	66-115
Pyrene	mg/kg (ppm)	0.83	89	65-112
Benzyl butyl phthalate	mg/kg (ppm)	0.83	95	56-131
3,3'-Dichlorobenzidine	mg/kg (ppm)	1.3	82	10-100
Benz(a)anthracene	mg/kg (ppm)	0.83	111	64-116
Chrysene	mg/kg (ppm)	0.83	92	66-119
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.83	98	30-165
Di-n-octyl phthalate	mg/kg (ppm)	0.83	114	44-140
Benzo(a)pyrene	mg/kg (ppm)	0.83	95	62-116
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	97	61-118
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	97	65-119
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	81	64-130
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	83	67-131
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	73	67-126

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QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 408404-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
N-Nitrosodimethylamine	mg/kg (ppm)	0.83	<0.01	57	71	16-124	22 vo
Phenol	mg/kg (ppm)	0.83	<0.05	57	68	36-118	18
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.83	<0.01	58	70	24-116	19
2-Chlorophenol	mg/kg (ppm)	0.83	<0.1	58	69	24-125	17
1,3-Dichlorobenzene	mg/kg (ppm)	0.83	<0.01	52	56	17-116	7
1,4-Dichlorobenzene	mg/kg (ppm)	0.83	<0.01	53	59	18-118	11
1,2-Dichlorobenzene	mg/kg (ppm)	0.83	<0.01	53	59	22-117	11
Benzyl alcohol	mg/kg (ppm)	4.2	<0.1	61	72	36-121	17
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.83	<0.01	58	71	20-126	20
2-Methylphenol	mg/kg (ppm)	0.83	<0.1	62	76	38-120	20
Hexachloroethane	mg/kg (ppm)	0.83	<0.01	54	58	10-207	7
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.83	<0.01	69	83	10-176	18
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.83	<0.2	67	77	39-121	14
Nitrobenzene	mg/kg (ppm)	0.83	<0.01	62	72	10-186	15
Isophorone	mg/kg (ppm)	0.83	<0.01	69	81	29-155	16
2-Nitrophenol	mg/kg (ppm)	0.83	<0.1	60	78	16-148	26 vo
2,4-Dimethylphenol	mg/kg (ppm)	0.83	<0.1	67	77	17-130	14
Benzoic acid	mg/kg (ppm)	2.5	<0.5	56	67	10-101	18
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.83	<0.01	64	75	37-121	16
2,4-Dichlorophenol	mg/kg (ppm)	0.83	<0.1	65	78	19-144	18
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.83	<0.01	54	68	35-116	23 vo
Naphthalene	mg/kg (ppm)	0.83	<0.001	57	67	28-125	16
Hexachlorobutadiene	mg/kg (ppm)	0.83	<0.01	54	63	25-126	15
4-Chloroaniline	mg/kg (ppm)	6.8	<1	60	71	21-117	17
4-Chloro-3-methylphenol	mg/kg (ppm)	0.83	<0.1	74	86	36-138	15
2-Methylnaphthalene	mg/kg (ppm)	0.83	<0.0005	62	71	10-192	14
1-Methylnaphthalene	mg/kg (ppm)	0.83	<0.0005	62	71	10-163	14
Hexachlorocyclopentadiene	mg/kg (ppm)	0.83	<0.03	59	73	10-136	21 vo
2,4,6-Trichlorophenol	mg/kg (ppm)	0.83	<0.1	74	85	16-151	14
2,4,5-Trichlorophenol	mg/kg (ppm)	0.83	<0.1	76	86	20-139	12
2-Chloronaphthalene	mg/kg (ppm)	0.83	<0.01	67	77	42-117	14
2-Nitroaniline	mg/kg (ppm)	4.2	<0.05	73	82	50-150	12
Dimethyl phthalate	mg/kg (ppm)	0.83	<0.1	73	82	50-150	12
Acenaphthylene	mg/kg (ppm)	0.83	<0.0005	71	78	45-128	9
2,6-Dinitrotoluene	mg/kg (ppm)	0.83	<0.05	79	90	11-182	13
3-Nitroaniline	mg/kg (ppm)	4.2	<1	62	79	36-110	24 vo
Acenaphthene	mg/kg (ppm)	0.83	<0.0005	71	79	36-125	11
2,4-Dinitrophenol	mg/kg (ppm)	1.7	<0.3	92	99	10-135	7
Dibenzofuran	mg/kg (ppm)	0.83	<0.0005	72	81	44-125	12
2,4-Dinitrotoluene	mg/kg (ppm)	0.83	<0.05	77	86	37-149	11
4-Nitrophenol	mg/kg (ppm)	1.7	<0.3	84	89	24-159	6
Diethyl phthalate	mg/kg (ppm)	0.83	<0.1	74	81	48-126	9
Fluorene	mg/kg (ppm)	0.83	<0.0005	73	80	48-121	9
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.83	<0.01	75	80	50-150	6
1,2-Diphenylhydrazine	mg/kg (ppm)	0.83	<0.01	75	82	49-122	9
N-Nitrosodiphenylamine	mg/kg (ppm)	0.83	<0.01	71	79	10-190	11
4-Nitroaniline	mg/kg (ppm)	4.2	<1	63	74	10-150	16
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.83	<0.3	102	114	10-148	11
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.83	<0.01	71	81	50-150	13
Hexachlorobenzene	mg/kg (ppm)	0.83	<0.01	72	79	50-150	9
Pentachlorophenol	mg/kg (ppm)	0.83	<0.05	86	100	18-159	15
Phenanthrene	mg/kg (ppm)	0.83	<0.0005	73	77	46-122	5
Anthracene	mg/kg (ppm)	0.83	<0.0005	73	78	30-144	7
Carbazole	mg/kg (ppm)	0.83	<0.0005	73	80	50-150	9
Di-n-butyl phthalate	mg/kg (ppm)	0.83	<0.1	73	79	43-124	8
Fluoranthene	mg/kg (ppm)	0.83	0.0013	74	79	50-150	7
Pyrene	mg/kg (ppm)	0.83	0.0013	71	78	40-134	9
Benzyl butyl phthalate	mg/kg (ppm)	0.83	<0.1	82	88	14-187	7
3,3'-Dichlorobenzidine	mg/kg (ppm)	1.3	<0.1	68	79	12-137	15
Benz(a)anthracene	mg/kg (ppm)	0.83	<0.001	77	85	50-150	10
Chrysene	mg/kg (ppm)	0.83	0.0024	74	82	50-150	10
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.83	<0.16	74	82	45-130	10
Di-n-octyl phthalate	mg/kg (ppm)	0.83	<0.1	84	95	25-161	12
Benzo(a)pyrene	mg/kg (ppm)	0.83	0.00081	77	85	50-150	10
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	0.0028	77	84	50-150	9
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	0.00064	75	82	50-150	9
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	0.0010	86	95	40-140	10
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	<0.001	81	90	41-136	11
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	<0.03	79	86	29-139	8

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
N-Nitrosodimethylamine	mg/kg (ppm)	0.83	84	42-110
Phenol	mg/kg (ppm)	0.83	81	47-128
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.83	88	35-131
2-Chlorophenol	mg/kg (ppm)	0.83	83	58-111
1,3-Dichlorobenzene	mg/kg (ppm)	0.83	78	47-109
1,4-Dichlorobenzene	mg/kg (ppm)	0.83	82	46-110
1,2-Dichlorobenzene	mg/kg (ppm)	0.83	79	50-110
Benzyl alcohol	mg/kg (ppm)	4.2	88	36-147
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.83	86	54-113
2-Methylphenol	mg/kg (ppm)	0.83	82	60-114
Hexachloroethane	mg/kg (ppm)	0.83	83	45-111
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.83	98	70-130
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.83	92	66-112
Nitrobenzene	mg/kg (ppm)	0.83	90	59-111
Isophorone	mg/kg (ppm)	0.83	92	52-128
2-Nitrophenol	mg/kg (ppm)	0.83	86	60-121
2,4-Dimethylphenol	mg/kg (ppm)	0.83	87	53-119
Benzoic acid	mg/kg (ppm)	2.5	73	13-223
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.83	91	64-112
2,4-Dichlorophenol	mg/kg (ppm)	0.83	89	63-111
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.83	83	56-111
Naphthalene	mg/kg (ppm)	0.83	81	57-107
Hexachlorobutadiene	mg/kg (ppm)	0.83	81	49-119
4-Chloroaniline	mg/kg (ppm)	6.8	58	10-136
4-Chloro-3-methylphenol	mg/kg (ppm)	0.83	94	70-130
2-Methylnaphthalene	mg/kg (ppm)	0.83	82	63-112
1-Methylnaphthalene	mg/kg (ppm)	0.83	82	63-113
Hexachlorocyclopentadiene	mg/kg (ppm)	0.83	94	46-127
2,4,6-Trichlorophenol	mg/kg (ppm)	0.83	94	65-116
2,4,5-Trichlorophenol	mg/kg (ppm)	0.83	96	67-117
2-Chloronaphthalene	mg/kg (ppm)	0.83	89	67-109
2-Nitroaniline	mg/kg (ppm)	4.2	88	46-148
Dimethyl phthalate	mg/kg (ppm)	0.83	91	70-130
Acenaphthylene	mg/kg (ppm)	0.83	88	70-130
2,6-Dinitrotoluene	mg/kg (ppm)	0.83	95	70-130
Acenaphthene	mg/kg (ppm)	0.83	90	66-112
2,4-Dinitrophenol	mg/kg (ppm)	1.7	104	63-132
Dibenzofuran	mg/kg (ppm)	0.83	90	63-117
2,4-Dinitrotoluene	mg/kg (ppm)	0.83	91	52-140
4-Nitrophenol	mg/kg (ppm)	1.7	83	16-187
Diethyl phthalate	mg/kg (ppm)	0.83	89	64-120
Fluorene	mg/kg (ppm)	0.83	89	67-117
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.83	92	70-130
1,2-Diphenylhydrazine	mg/kg (ppm)	0.83	89	68-115
N-Nitrosodiphenylamine	mg/kg (ppm)	0.83	90	61-118
4-Nitroaniline	mg/kg (ppm)	4.2	74	28-121
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.83	114	51-152
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.83	94	70-130
Hexachlorobenzene	mg/kg (ppm)	0.83	92	70-130
Pentachlorophenol	mg/kg (ppm)	0.83	94	60-133
Phenanthrene	mg/kg (ppm)	0.83	91	70-130
Anthracene	mg/kg (ppm)	0.83	90	70-130
Carbazole	mg/kg (ppm)	0.83	93	63-122
Di-n-butyl phthalate	mg/kg (ppm)	0.83	91	48-128
Fluoranthene	mg/kg (ppm)	0.83	91	70-130
Pyrene	mg/kg (ppm)	0.83	91	70-130
Benzyl butyl phthalate	mg/kg (ppm)	0.83	98	64-135
3,3'-Dichlorobenzidine	mg/kg (ppm)	1.3	47	10-134
Benz(a)anthracene	mg/kg (ppm)	0.83	94	70-130
Chrysene	mg/kg (ppm)	0.83	91	70-130
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.83	90	59-116
Di-n-octyl phthalate	mg/kg (ppm)	0.83	91	46-129
Benzo(a)pyrene	mg/kg (ppm)	0.83	94	68-120
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	93	67-128
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	95	70-130
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	112	67-129
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	107	67-128
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	107	65-130

Date of Report: 09/03/24
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Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	95	90	80-120	5
Cadmium	mg/kg (ppm)	10	98	92	80-120	6
Chromium	mg/kg (ppm)	50	101	95	80-120	6
Copper	mg/kg (ppm)	50	99	93	80-120	6
Lead	mg/kg (ppm)	50	98	93	80-120	5
Manganese	mg/kg (ppm)	20	100	96	80-120	4
Mercury	mg/kg (ppm)	5	103	99	80-120	4
Nickel	mg/kg (ppm)	25	100	94	80-120	6
Selenium	mg/kg (ppm)	5	94	88	80-120	7
Zinc	mg/kg (ppm)	50	100	94	80-120	6

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 408228-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	<1	92	95	75-125	3
Cadmium	mg/kg (ppm)	10	<1	96	94	75-125	2
Chromium	mg/kg (ppm)	50	1.30	100	91	75-125	9
Copper	mg/kg (ppm)	50	38.0	110 b	111 b	75-125	1 b
Lead	mg/kg (ppm)	50	14.7	96 b	114 b	75-125	17 b
Manganese	mg/kg (ppm	20	11.1	101 b	126 b	75-125	22 b
Mercury	mg/kg (ppm	5	<1	97	97	75-125	0
Nickel	mg/kg (ppm)	25	14.4	97 b	128 b	75-125	28 b
Selenium	mg/kg (ppm)	5	<1	96	95	75-125	1
Zinc	mg/kg (ppm)	50	95.4	106 b	320 b	75-125	100 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	89	80-120
Cadmium	mg/kg (ppm)	10	94	80-120
Chromium	mg/kg (ppm)	50	100	80-120
Copper	mg/kg (ppm)	50	96	80-120
Lead	mg/kg (ppm)	50	93	80-120
Manganese	mg/kg (ppm)	20	100	80-120
Mercury	mg/kg (ppm)	5	93	80-120
Nickel	mg/kg (ppm)	25	99	80-120
Selenium	mg/kg (ppm)	5	91	80-120
Zinc	mg/kg (ppm)	50	94	80-120

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 408384-07 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	5.53	100 b	83 b	75-125	19 b
Cadmium	mg/kg (ppm)	10	<1	96	91	75-125	5
Chromium	mg/kg (ppm)	50	86.7	112 b	73 b	75-125	42 b
Copper	mg/kg (ppm)	50	40.5	86 b	71 b	75-125	19 b
Lead	mg/kg (ppm)	50	56.2	79 b	60 b	75-125	27 b
Manganese	mg/kg (ppm	20	54.0	128 b	88 b	75-125	37 b
Mercury	mg/kg (ppm	5	<1	74 vo	72 vo	75-125	3
Nickel	mg/kg (ppm)	25	6.16	85 b	79 b	75-125	7 b
Selenium	mg/kg (ppm)	5	<1	85	82	75-125	4
Zinc	mg/kg (ppm)	50	34.4	84 b	70 b	75-125	18 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	89	80-120
Cadmium	mg/kg (ppm)	10	96	80-120
Chromium	mg/kg (ppm)	50	105	80-120
Copper	mg/kg (ppm)	50	103	80-120
Lead	mg/kg (ppm)	50	98	80-120
Manganese	mg/kg (ppm)	20	104	80-120
Mercury	mg/kg (ppm)	5	96	80-120
Nickel	mg/kg (ppm)	25	104	80-120
Selenium	mg/kg (ppm)	5	93	80-120
Zinc	mg/kg (ppm)	50	101	80-120

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 408228-01 1/30 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.25	<0.02	83	90	50-150	8
Aroclor 1260	mg/kg (ppm)	0.25	<0.02	97	115	50-150	17

Laboratory Code: Laboratory Control Sample 1/30

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Aroclor 1016	mg/kg (ppm)	0.25	105	50-138
Aroclor 1260	mg/kg (ppm)	0.25	114	54-146

Date of Report: 09/03/24
Date Received: 08/13/24
Project: TWAAFA M0615.20.014, F&BI 408228

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 408384-07 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Control Limits	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.05	<0.002	887 ip	1019 ip	50-150	14
Aroclor 1260	mg/kg (ppm)	0.05	0.52	1558 b	1718 b	50-150	10 b

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Aroclor 1016	mg/kg (ppm)	0.05	73	50-138
Aroclor 1260	mg/kg (ppm)	0.05	88	54-146

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

408228

8/13/24 N3 / D4 / VW1

SAMPLE CHAIN OF CUSTODY

Page # 1 of 2

Report To Audrey Hackett

Company Maul Foster & Alongi

Address 2815 2nd Ave Suite 540

City, State, ZIP Seattle, WA, 98121

Phone 206-556-2015 Email ahackett@maulfoster.com

SAMPLERS (signature)

PROJECT NAME: TWAAFA Hylebos Marsh Subsurface Investigation

PO #: M0615.20.014

REMARKS: Remove debris from auto fluff-impacted soil samples prior to prep/analysis. H = Hold.

Project Specific RLs - Yes / No

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME: Standard Turnaround; RUSH; Rush charges authorized by:

SAMPLE DISPOSAL: Dispose after 30 days; Archive Samples; Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	SVOCs EPA 8270	PCBs EPA 8082	Metals EPA 6020B (As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Se, Zn)	PCB Congeners EPA 1668C		Notes
						ANALYSES REQUESTED									All Samples Hold
TWA-SB-09-S-6.0	01	8/12/24	11:45	Soil	1								H		H=Hold
TWA-SB-16-S-1.5	02	8/12/24	12:40	Soil	1								H		●=analyze
TWA-SB-10-S-6.5	03	8/12/24	13:45	Soil	1								H		per AH 9/6/24
TWA-SB-11-S-1.7	04	8/12/24	15:00	Soil	1								●		ME
TWA-SB-11-S-6.0	05	8/12/24	15:40	Soil	1								H		
TWA-SB-11-S-16.0	06	8/12/24	16:00	Soil	1								H		
TWA-SB-12-S-8.0	07	8/13/24	11:15	Soil	1								●		
TWA-SB-12-S-9.0	08	8/13/24	11:30	Soil	1								●		
TWA-SB-12-S-18.5	10	8/13/24	12:30	Soil	1								●		
TWA-SB-13-S-7.5	11	8/13/24	13:30	Soil	1								H		

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Christian Sifford	MFA	8/13/24	17:30
Received by:	Michael Erdahl	F&B Inc	8/13/24	1730
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

408228

8/13/24 N3/D4/VW,

SAMPLE CHAIN OF CUSTODY

Report To Audrey Hackett

Company Maul Foster & Alongi

Address 2815 2nd Ave Suite 540

City, State, ZIP Seattle, WA, 98121

Phone 206-556-2015 Email ahackett@maulfoster.com

SAMPLERS (*signature*)

PROJECT NAME: TWAAFA Hylebos Marsh Subsurface Investigation

PO #: M0615.20.014

REMARKS: Remove debris from auto fluff-impacted soil samples prior to prep/analysis. H = Hold.

Project Specific RLs - Yes / (No)

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
Standard Turnaround
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Archive Samples
Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	VOCs EPA 8260	SVOCs EPA 8270	PCBs EPA 8082	Metals EPA 6020B (As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Se, Zn)	PCB Congeners EPA 1668C		Notes
TWA-SB-14-S-1.5	12	8/13/24	14:15	Soil	1								H		
TWA-SB-15-S-1.7	13	8/13/24	15:15	Soil	1								H		
TWA-SB-12-S-16.9	09	8/13/24	12:40	Soil	1								●		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Christian Sifford	MFA	8/13/24	17:30
Received by:		Michael Endahl	F&B Inc	8/13/24	1730
Relinquished by:					
Received by:					

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 408228 CLIENT MFA INITIALS/ DATE: 08/13/24 JM

If custody seals are present on cooler, are they intact? ☒ NA ☐ YES ☐ NO

Cooler/Sample temperature 1 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☒ YES ☐ NO

How did samples arrive?
☒ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: JB/AMB 8/13
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0-1 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☒ Yes ☐ No	☐ Not on COC/label
Date Sampled	☒ Yes ☐ No	☐ Not on COC/label
Time Sampled	☒ Yes ☐ No	☐ Not on COC/label
# of Containers	☒ Yes ☐ No	
Relinquished	☒ Yes ☐ No	
Requested analysis	☒ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☒ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

Attachment F

Data Validation Memorandum

MAUL FOSTER ALONGI

Data Validation Memorandum

Project No. M0615.20.014 | September 23, 2024 | Port of Tacoma

Maul Foster & Alongi, Inc. (MFA), conducted an independent review of the quality of analytical results for soil samples and an associated quality control samples collected on August 12 and 13, 2024, at the Hylebos Marsh property, located at 1212 Taylor Way in Tacoma, Washington.

Friedman & Bruya, Inc. (F&B), performed the analyses. MFA reviewed F&B report number 408228. The analyses performed and the samples analyzed are listed in the following tables. Not all analyses were performed on all samples. Some analyses were initially submitted on hold and were initiated after sample receipt by the MFA project manager.

Analysis	Reference
Diesel- and oil-range hydrocarbons	NWTPH-Dx
Gasoline-range hydrocarbons	NWTPH-Gx
Hydrocarbon identification	NWTPH-HCID
Percent moisture	ASTM D2216-98
Polychlorinated biphenyls as Aroclors	EPA 8082A
Semivolatile organic compounds	EPA 8270E
Total metals	EPA 6020B
Volatile organic compounds	EPA 8260D

Notes
ASTM = ASTM International.
EPA = U.S. Environmental Protection Agency.
HCID = hydrocarbon identification.
NWTPH = Northwest Total Petroleum Hydrocarbons.

Samples Analyzed	
Report 408228	
TWA-SB-09-S-6.0	TWA-SB-12-S-9.0
TWA-SB-16-S-1.5	TWA-SB-12-S-16.9
TWA-SB-10-S-6.5	TWA-SB-12-S-18.5
TWA-SB-11-S-1.7	TWA-SB-13-S-7.5
TWA-SB-11-S-6.0	TWA-SB-14-S-1.5
TWA-SB-11-S-16.0	TWA-SB-15-S-1.7
TWA-SB-12-S-8.0	Trip Blank

Data Validation Procedures

Analytical results were evaluated according to applicable sections of U.S. Environmental Protection Agency (EPA) guidelines for data review (EPA 2020a, 2020b) and appropriate laboratory- and method-specific guidelines (EPA 1986, F&B 2022).

Data validation procedures were modified, as appropriate, to accommodate quality control requirements for methods that EPA data review guidelines do not specifically address (e.g., Northwest Total Petroleum Hydrocarbons [NWTPH] Hydrocarbon Identification [HCID]).

ASTM D2216-98 percent moisture results reported by the laboratory for dry-weight correction were reviewed for completeness but were not included in Stage 2A data validation.

Based on the data quality assurance/quality control review described herein, the data, with the appropriate final data qualifiers assigned, are considered acceptable for their intended use. Final data qualifiers represent qualifiers originating from the laboratory and accepted by the reviewer, and data qualifiers assigned by the reviewer during validation.

Final data qualifiers:

- J = result is estimated.
- U = result is non-detect at the method reporting limit (MRL).
- UJ = result is non-detect with an estimated MRL.

General Qualifications

Total Petroleum Hydrocarbons

Method NWTPH-HCID is a qualitative analysis. Hydrocarbon identification results in report 408228 are reported by F&B as either detect or non-detect, and the laboratory provides associated MRLs for non-detect results. Quantitative NWTPH-Dx follow-up analysis for detected results are included in the report, in accordance with the method and project requirements.

In report 408228, F&B flagged all detected NWTPH-Dx diesel-range hydrocarbons results as having chromatographic patterns that did not resemble the fuel standard used for quantitation. Results were reported as diesel-range hydrocarbons instead of specific fuel products; thus, qualification was not required.

Results of Record

According to report 408228, F&B reported two sets of EPA Method 8260D results for trichlorofluoromethane for samples TWA-SB-12-S-8.0, TWA-SB-12-S-9.0, and TWA-SB-12-S-18.5; the reviewer confirmed that the laboratory reanalyzed this analyte due to initial detected results associated with low calibration results. Additionally, F&B reported two sets of EPA Method 8270E bis(2-ethylhexyl) phthalate results for samples TWA-SB-12-S-8.0 and TWA-SB-12-S-16.9, and two sets of EPA Method 8082A Aroclor 1242, Aroclor 1254, and Aroclor 1260 results for samples TWA-SB-12-S-8.0, TWA-SB-12-S-9.0, and the Aroclor 1254 and 1260 results for samples TWA-SB-12-S-16.9 and TWA-SB-12-S-18.5; the reviewer confirmed that the laboratory reanalyzed these analytes at higher dilutions due to initial results above the calibration range of the instrument. The secondary analyses are considered the results of record due to passing calibration results or results within the calibration range of the instrument, as shown in the following table. The initial analyses with quality control issues are not qualified in the Qualifications Applied by the Reviewer section because they are not the results of record.

Sample	Analysis	Analyte	Primary Analysis (mg/kg)	Secondary Analysis (mg/kg)	Result of Record (mg/kg)
TWA-SB-12-S-8.0	EPA 8260D	Trichlorofluoromethane	0.024 J	0.012 J	0.012 J
	EPA 8270E	Bis(2-ethylhexyl) phthalate	230	320	320
	EPA 8082A	Aroclor 1242	1.4	1.8	1.8
		Aroclor 1254	3.5	5.3	5.3
		Aroclor 1260	2.2	3.3	3.3
TWA-SB-12-S-9.0	EPA 8260D	Trichlorofluoromethane	0.10 J	0.081 J	0.081 J
	EPA 8082A	Aroclor 1242	0.99	1.3	1.3
		Aroclor 1254	2.2	3.3	3.3
		Aroclor 1260	1.1	1.7	1.7
TWA-SB-12-S-16.9	EPA 8270E	Bis(2-ethylhexyl) phthalate	74	100	100
	EPA 8082A	Aroclor 1254	1.3	1.9	1.9
		Aroclor 1260	1.8	2.6	2.6
TWA-SB-12-S-18.5	EPA 8260D	Trichlorofluoromethane	2.8	1.7	1.7
	EPA 8082A	Aroclor 1254	1.0	1.6	1.6
		Aroclor 1260	2.0	2.6	2.6

Notes
EPA = U.S. Environmental Protection Agency.
J = result is estimated.
mg/kg = milligrams per kilogram.

Qualifications Applied by the Reviewer

The following table shows qualifications assigned by the reviewer during validation of report 408228.

Sample	Analysis	Analyte	Original Result (mg/kg)	Qualified Result (mg/kg)	Qualification Section
Trip Blank	EPA 8260D	Acetone	50 U (ug/L)	50 UJ (ug/L)	CCV Results
		2-Butanone	20 U (ug/L)	20 UJ (ug/L)	
TWA-SB-09-S-6.0	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.005 U	0.005 UJ	
TWA-SB-16-S-1.5	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.005 U	0.005 UJ	
TWA-SB-10-S-6.5	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.005 U	0.005 UJ	
TWA-SB-11-S-1.7	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Benzoic acid	12 U	12 UJ	

Sample	Analysis	Analyte	Original Result (mg/kg)	Qualified Result (mg/kg)	Qualification Section
TWA-SB-11-S-6.0	EPA 8260D	Acetone	1 UJ	1 UJ[a]	CCV Results
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.005 U	0.005 UJ	
	EPA 6020B	Manganese	18	18 J	MS/MSD Results
		Nickel	23	23 J	
		Zinc	160	160 J	
TWA-SB-11-S-16.0	EPA 8260D	Acetone	1 UJ	1 UJ[a]	CCV Results
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.005 U	0.005 UJ	
TWA-SB-12-S-8.0	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Benzoic acid	50 U	50 UJ	
TWA-SB-12-S-9.0	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Benzoic acid	12 U	12 UJ	
TWA-SB-12-S-18.5	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Benzoic acid	12 U	12 UJ	
TWA-SB-13-S-7.5	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.005 U	0.005 UJ	
TWA-SB-14-S-1.5	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Benzoic acid	12 U	12 UJ	
TWA-SB-15-S-1.7	EPA 8260D	Methylene chloride	0.11 UJ	0.11 UJ[a]	
	EPA 8270E	Hexachlorocyclopentadiene	0.15 U	0.15 UJ	
		Benzo(g,h,i)perylene	0.072	0.072 J	

Notes
EPA = U.S. Environmental Protection Agency.
J = result is estimated.
mg/kg = milligrams per kilogram.
U = result is non-detect at the method reporting limit.
ug/L = micrograms per liter.
UJ = result is non-detect with an estimated method reporting limit.
[a]Final qualification due to quality control issues as specified by the reviewer, and due to estimated results below standard MRLs as specified by the laboratory.

Sample Conditions

Sample Custody

Sample custody was appropriately documented on the chain-of-custody form accompanying the report.

Holding Times

Extractions and analyses were performed within the recommended holding times.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

Reporting Limits

The laboratory evaluated results to MRLs. Samples that required dilutions because of high analyte concentrations, matrix interferences, and/or dilutions necessary for preparation and/or analysis were reported with raised MRLs.

The reviewer confirmed that when samples were diluted for analysis or when a higher sample volume was used for the extraction, F&B provided the preparation or dilution factor after the laboratory sample identification number.

The laboratory qualified results below standard MRLs with J for detects and UJ for non-detects, and the reviewer accepted the laboratory qualifications. Some results were additionally qualified by the reviewer due to quality control results, as shown in the General Qualifications section.

Blank Results

Method Blanks

Laboratory method blanks are used to evaluate whether laboratory contamination was introduced during sample preparation and analysis. Laboratory method blank analyses were performed at the required frequencies, in accordance with laboratory- and method-specific requirements.

All laboratory method blank results were non-detect to MRLs.

Equipment Rinsate Blanks

Equipment rinsate blanks are used to evaluate the adequacy of the field equipment decontamination process when decontaminated sampling equipment is used to collect samples.

These blanks were not required for this sampling event, as all samples were collected using dedicated or single-use equipment.

Trip Blanks

Trip blanks are used to evaluate whether volatile organic compound contamination was introduced during shipping and field handling procedures.

A trip blank (Trip Blank) was submitted with the sample delivery group 408228 for EPA Method 8260D analysis.

The trip blank was non-detect to MRLs for all target analytes.

Laboratory Control Sample and Laboratory Control Sample Duplicate Results

Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) results are used to evaluate laboratory precision and accuracy. Where LCSD were not reported, laboratory precision was evaluated using laboratory duplicate or matrix spike (MS) and matrix spike duplicate (MSD) results. All LCSs and remaining LCSDs were prepared and analyzed at the required frequency, in accordance with laboratory- and method-specific requirements.

All LCS and LCSD results were within acceptance limits for percent recovery and relative percent difference (RPD).

Laboratory Duplicate Results

Laboratory duplicate results are used to evaluate laboratory precision and sample homogeneity. Where laboratory duplicate results were not reported, laboratory precision was evaluated using LCS and LCSD or MS and MSD results. All remaining laboratory duplicate samples were prepared and analyzed at the required frequency, in accordance with laboratory- and method-specific requirements.

Laboratory duplicate results greater than five times the MRL were evaluated using laboratory RPD control limits. A secondary criterion was used when laboratory duplicate results were non-detect or less than five times the MRL. Results meet the secondary criterion if the absolute difference of the laboratory duplicate sample result and the parent sample result, or the MRL for non-detects, is equal to or less than the MRL value of the parent sample.

All laboratory duplicate results met the acceptance criteria.

Matrix Spike and Matrix Spike Duplicate Results

MS and MSD results are used to evaluate laboratory precision, accuracy, and the effect of the sample matrix on sample preparation and target analyte recovery. Where MS and/or MSD were not reported, laboratory precision and accuracy were evaluated using LCS and/or LCSD and laboratory duplicate results. All remaining MS and MSD samples were prepared and analyzed at the required frequency, in accordance with laboratory- and method-specific requirements.

When MS and MSD were prepared from samples with high concentrations of target analytes, associated MS and/or MSD percent recovery and/or RPD control limit exceedances did not require qualification because spike concentrations could not be accurately quantified. High concentrations of target analytes are defined as four times the spike amount for all analyses.

When MS and MSD were prepared with samples from unrelated projects, the MS and/or MSD percent recovery and/or RPD control limit exceedances did not require qualification because these sample matrices were not representative of project sample matrices.

According to report 408228, the EPA Method 8260D MS and MSD prepared with sample TWA-SB-09-S-6.0 had an acetone RPD of 39 percent. The MS and MSD were within percent recovery acceptance limits. The associated sample result was non-detect and did not require qualification.

According to report 408228, the EPA Method 6020B MS and MSD prepared with sample TWA-SB-11-S-6.0 had some results above the 125 percent recovery acceptance criteria and 20 percent RPD acceptance limit. The manganese MSD recovered at 126 percent with an RPD of 22 percent between the MS and MSD, the nickel MSD recovered at 128 percent with an RPD of 28 percent between the MS and MSD, and the zinc MSD recovered at 320 percent with an RPD of 100 percent between the MS and MSD. The reviewer qualified the manganese, nickel, and zinc results from sample TWA-SB-11-S-6.0 with J, as shown in the in the table in the General Qualifications section.

All remaining MS and MSD results were within acceptance limits for percent recovery and RPD.

Surrogate Results

Surrogate results are used to evaluate laboratory performance of target organic compounds for individual samples.

When surrogate results were outside percent recovery acceptance limits because of dilutions necessary to quantify high concentrations of target analytes, qualification by the reviewer was not required because surrogate concentrations could not be accurately quantified.

All remaining surrogate results were within percent recovery acceptance limits.

Continuing Calibration Verification Results

Continuing calibration verification (CCV) results are used to evaluate instrument sensitivity, precision, and accuracy throughout the analytical sequence.

CCV results are not required for Stage 2A validation, however, the reviewer evaluated results flagged by the laboratory for associated CCV exceedances. Surrogate or batch quality control results flagged by the laboratory based on CCV exceedances but meeting percent recovery and/or RPD acceptance criteria did not require qualification by the reviewer.

In report 408228, the laboratory flagged several NWTPH-Dx, EPA Method 8260D, EPA Method 8270E, sample results due to associated CCV results above acceptance criteria. Where CCV results were above acceptance criteria and the associated sample results were non-detect, qualification by the reviewer was not required.

According to report 408228, the EPA Method 8260D acetone and 2-butanone CCV results associated with the Trip Blank sample and the laboratory method blank (04-1846 mb) were below acceptance criteria, and results are considered estimated. The reviewer qualified the associated acetone and 2-butanone results from the Trip Blank with UJ, as shown in the table in the General Qualifications section. The laboratory method blank results did not require qualification.

According to report 408228, the EPA Method 8260D methylene chloride CCV results associated with samples TWA-SB-09-S-6.0, TWA-SB-16-S-1.5, TWA-SB-10-S-6.5, and TWA-SB-11-S-1.7, TWA-SB-13-S-7.5, TWA-SB-14-S-1.5, and TWA-SB-15-S-1.7, the acetone CCV results associated with samples TWA-SB-11-S-6.0, TWA-SB-11-S-16.0, and the initial trichlorofluoromethane and methylene chloride CCV results associated with samples TWA-SB-12-S-8.0, TWA-SB-12-S-9.0, and TWA-SB-12-S-18.5 were below acceptance criteria, and results are considered estimated. The reviewer qualified the associated methylene chloride and acetone sample results with UJ for non-detects and J for detects, as shown in the table in the General Qualifications section. The initial trichlorofluoromethane were not qualified since they were not the results of record, as shown in the Results of Record section.

According to report 408228, the EPA Method 8270E hexachlorocyclopentadiene and benzo(g,h,i)perylene CCV results associated with samples TWA-SB-09-S-6.0, TWA-SB-16-S-1.5, TWA-SB-10-S-6.5, TWA-SB-11-S-6.0, TWA-SB-11-S-16.0, TWA-SB-13-S-7.5, TWA-SB-15-S-1.7, and the benzoic acid CCV results associated with samples TWA-SB-11-S-1.7, TWA-SB-12-S-8.0, TWA-SB-12-S-9.0, TWA-SB-12-S-18.5, and TWA-SB-14-S-1.5 were below acceptance criteria, and results are considered estimated. The reviewer qualified the associated hexachlorocyclopentadiene, benzo(g,h,i)perylene, and benzoic acid sample results with UJ for non-detects and J for detects, as shown in the table in the General Qualifications section.

Field Duplicate Results

Field duplicate results are used to evaluate field precision and sample homogeneity. No field duplicate samples were submitted for analysis.

Data Package

The data package was reviewed for transcription errors, omissions, and anomalies.

At MFA's request, report 408228 was revised on September 25, 2024, to remove extraneous EPA Method 8270E reanalyses.

No other issues were found.

References

EPA. 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* EPA publication SW-846. 3rd ed. U.S. Environmental Protection Agency. Final updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2015), VI phase I (2017), VI phase II (2018), VI phase III (2019), VII phase I (2019), and VII phase II (2020).

EPA. 2020a. *National Functional Guidelines for Inorganic Superfund Methods Data Review.* EPA 542-R-20-006. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.

EPA. 2020b. *National Functional Guidelines for Organic Superfund Methods Data Review.* EPA 540-R-20-005. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.

F&B. 2022. *Quality Assurance Manual.* Rev. 18. Friedman & Bruya, Inc.: Seattle, WA. December 9.