

## **Preliminary Site Investigation Summary**

### **USCG Yard Grove Site**

This report presents a preliminary summary of the site investigation work conducted at the U.S. Coast Guard (USCG) Yard Grove Site, including a summary of site observations and a review of laboratory data. This report was prepared using preliminary data from the laboratory that has not yet been checked and validated. All results should be considered preliminary at this point.

#### **SITE OBSERVATIONS**

Below is a discussion of observations within each of the 6 test pits that were excavated as part of this investigation. The test pits are discussed in the order in which they were investigated. Test Pit locations are depicted on the attached figure.

##### **Test Pit 12 (TP-GD-12)**

Test pit TP-GD-12 was located across the edge of the fill near the northeast corner of the fill. Nonnative fill material was first observed at a depth of approximately 1.5 feet below ground surface (bgs) and included concrete, brick, fabric, and a significant amount of glass. Wood, metal, and ceramic debris were also observed. Fill material was observed to a depth of approximately 5.5 feet bgs, below which appeared to be native medium and coarse sands. The test pit was extended until the water table was reached, which was at a depth of approximately 7 feet bgs. A total of six soil samples were collected from the designated intervals and analyzed for TCL SVOCs, TCL pesticides, PCBs, and TAL metals.

Between a depth of 2 to 4 feet bgs, the contractor observed what appeared to be charred paper and partially melted/fused metal debris. As such, four of the samples collected were also analyzed for dioxins/furans.

##### **Test Pit 11 (TP-GD-11)**

Test pit TP-GD-11 was located west of TP-GD-12 and was placed in the middle of the fill material, close to the fence marking the southern property boundary. Filter fabric was observed just below the surface (depth of less than 1 foot); more significant fill material was observed beginning at a depth of approximately 3 feet bgs. The fill consisted of dark brown sand and gravel, as well as ceramic, wood, and metal debris. A significant pocket of finely shredded wood was observed from approximately 4 to 5 feet bgs. From 5 to 7 feet bgs, fill material and debris were observed mixed in with potentially native sandy soils. The water table was observed at a depth of approximately 7 feet bgs.

Six soil samples were collected from the designated intervals for TCL SVOCs, TCL pesticides, PCBs, and TAL metals analyses.

##### **Test Pit 10 (TP-GD-10)**

Test pit TP-GD-10 was located west of TP-GD-11 along the northern edge of the fill. The top of fill was observed at approximately 1-foot bgs, and consisted of dark brown sand and gravel along with pieces of wood and metal debris. A significant amount of debris was observed at this test pit from approximately 2 feet to 5 feet bgs. The debris was small to very large and included scrap metal, metal grates, wires/cables, piping, and other metallic items. Textile/fabric material was also observed. The water table was observed at a depth of approximately 5 feet bgs; however, the fill material extended deeper

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below the top of the water table. The bottom of the fill material could not be found at this location. The scrap metal removed from the pit was later disposed of as scrap metal.

The edge of the fill could not be found at the original test pit location. Therefore, the pit was extended towards the north until the edge was found. The edge of the fill was observed along the north side of the gravel road which runs down towards the piers.

Five soil samples were collected from this test pit for TCL SVOCs, TCL pesticides, PCBs, and TAL metals analyses. Because the water table was at a depth of 5 feet bgs, a sample could not be collected from the 6- to 10-foot interval.

### **Test Pit 9 (TP-GD-09)**

Test pit TP-GD-09 was located within the fill west of TP-GD-10. The test pit was extended to a depth of approximately 5.5 feet bgs. The lithology consisted mostly of loamy tan and brown sands. The water table was located within a zone of coarse sand and gravel which began around 5 feet bgs. No obvious fill material or debris was observed.

Five soil samples were collected from this test pit for TCL SVOCs, TCL pesticides, PCBs, and TAL metals analyses. Because the water table was at a depth of 5 feet bgs, a sample could not be collected from the 6- to 10-foot interval.

### **Test Pit 8 (TP-GD-08)**

Test pit TP-GD-08 was located along the edge of the fill between TP-GD-07 and TP-GD-09. Digging was initiated at the planned location; however, at a depth of 3.5 feet, no fill was yet observed. The test pit was subsequently moved 5 to 10 feet to the south and restarted. At a depth of 1.5 feet, an approximately 1-inch-diameter pipe was observed at the northern end of the test pit, running in an east-west direction. This is believed to be the same piping observed in TP-GD-07.

Fill material was also observed beginning at a depth of 1.5 feet bgs, which included gravel and a piece of concrete with rebar. Wood chips and other wood debris, along with coarse sands, were observed from approximately 3 feet bgs until the water table was encountered at a depth of 5 feet bgs.

The shallow depth of the water table allowed for only four samples to be collected.

### **Test Pit 7 (TP-GD-07)**

Test pit TP-GD-07 was the westernmost test pit investigated, located within close proximity to Curtis Creek. Fill soils were observed from just below the surface to the water table located at a depth of approximately 4 feet bgs. The soil consisted primarily of coarse sand and gravel. From a depth of 2 feet bgs to the water table, dark-colored small flakes were observed. The flakes appeared to be plastic; however, it could not be determined. It should also be noted that a 1-inch-diameter piping was observed traversing the north side of TP-GD-07 in an east-west direction. The pipe was located at a depth of approximately 1.5 to 2 feet bgs and appeared to be an out-of-service fuel line. No fuel was observed and no odors were noted.

The shallow depth of the water table allowed for only four samples to be collected; samples were not collected from the designated depth intervals of 4 to 6 feet and 6 to 10 feet bgs. The samples collected were analyzed for TCL SVOCs, TCL pesticides, PCBs, and TAL metals.

## LABORATORY DATA - SOIL

Tables 1 and 2 below provide a summary of all soil results for both the test pit and soil boring samples. Tables 3 and 4 provide a summary of metals

- At least one sample from every test pit contained a concentration of at least one polycyclic aromatic hydrocarbon (PAH) compound which exceeded USEPA Regional Screening Levels (RSLs). Additionally, multiple samples from all four soil borings exceeded for at least one PAH compound.
- Polychlorinated biphenyls (PCBs) were widespread throughout the test pit samples. A total of 21 samples, including at least two samples from every test pit, contained a concentration of PCBs which exceeded USEPA RSLs. An additional six samples collected from the soil borings also exceeded for PCBs. PCBs were observed both within and outside the fill.
- One soil sample collected from TP-GD-11 contained a concentration of dieldrin (a pesticide) which very slightly exceeded its USEPA Residential RSL. That was the only pesticide exceedance observed.
- Metals were by far the most common and widespread group of analytes detected at the site. Fifteen different metals exceeded USEPA RSLs in the 33 test pit samples collected. Seven of the 15 exceeded for both the Residential and Industrial RSLs. Metals exceedances were noticeably more widespread in Test Pits 10, 11, and 12 as compared to Test Pits 7, 8, and 9. The majority of the lowest concentrations of each metal detected were observed in samples collected outside the fill, while a majority of the highest concentration of each metal was observed in samples collected from within fill material.

Of the 15 metals for which one or more USEPA RSL exceedance was observed, the highest concentration of 10 of those metal was observed at Test Pit 10 at a depth of 1 to 2 feet bgs. This was also the only sample to exceed for all 15 metals for which exceedances were observed. Metals exceedances were somewhat less prevalent in the soil boring samples as compared to the test pit samples.

- Soil sample results for metals were also compared to existing background data. Specifically, the contractor compared the 2018 data to the Draft Background Sampling Report dated February 2005. The 2005 report examined both surface and subsurface soils, and included data from multiple areas (datasets) of the USCG Yard property. The contractor compared the current soil data with Dataset 1: Undisturbed Soil, which included 20 samples collected on the east side of the property within the same soil type (Evesboro-Urban Land Complex) as the Grove Dump Site.

The 20 samples included 10 shallow surface samples (depths of 0 to 1.5 feet bgs) and subsurface samples (depths of 2 to 4 feet bgs). Therefore, PHE used samples collected from the test pits from the same approximate depth intervals for comparison. Based on a comparison of the two sets of data, it appears likely that aluminum, arsenic, cobalt, copper, and iron may be attributable to background conditions and not directly related to the fill.

- In general, the exceedances observed at soil boring 3 and 4 are consistent with background concentrations observed at the facility.

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Table 1. Summary of Test Pit Soil Sample Results					
Test Pit ID	Exceedances of USEPA Residential and/or Industrial RSLs				Sample Location
Sample Depth (ft bgs)	Metals	SVOCs	PCBs	Pesticides	
<b>TP-GD-07</b>					
0 to 0.5	✓	✓	✓		Above fill
0.5 to 1.0	✓	✓	✓		Above fill
1.0 to 2.0	✓	✓	✓		Above fill
3.0 to 4.0	✓	✓	✓		Within fill
<b>TP-GD-08</b>					
0 to 0.5	✓	✓			Above fill
1.0 to 1.25	✓	✓	✓		Within fill
1.25 to 2.0	✓	✓			Within fill
3.0 to 4.0	✓	✓	✓		Within fill
<b>TP-GD-09</b>					
0 to 0.5	✓	✓	✓		No fill observed
0.5 to 1.0	✓	✓			No fill observed
1.0 to 2.0	✓	✓	✓		No fill observed
2.0 to 3.0	✓	✓			No fill observed
4.0 to 5.0	✓	✓			No fill observed
<b>TP-GD-10</b>					
0 to 0.5	✓	✓			Above fill
0.5 to 1.0	✓	✓	✓		Above fill
1.0 to 2.0	✓	✓	✓		Within fill
2.0 to 4.0	✓	✓	✓		Within fill
5.0 to 6.0	✓	✓			Below fill
<b>TP-GD-11</b>					
0 to 0.5	✓	✓	✓		Above fill
0.5 to 1.0	✓	✓	✓		Above fill
1.0 to 2.0	✓	✓			Above fill
3.5 to 4.0	✓	✓	✓		Within fill
5.0 to 6.0	✓	✓	✓	✓	Within fill
6.0 to 7.0	✓	✓	✓		Within fill
<b>TP-GD-12</b>					
0 to 0.5	✓	✓			Above fill
0.5 to 1.0	✓	✓	✓		Above fill
1.0 to 2.0	✓	✓	✓		Within fill
2.0 to 4.0	✓	✓	✓		Within fill
4.0 to 6.0	✓	✓	✓		Within fill
6.0 to 7.0	✓	✓	✓		Below fill

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Table 2. Summary of Soil Boring Sample Results					
Soil Boring ID	Exceedances of USEPA Residential and/or Industrial RSLs				Sample Location
Sample Depth (ft bgs)	Metals	SVOCs	PCBs	Pesticides	
<b>SB-GD-01</b>					
0 to 1.0	✓	✓			Above fill
1.0 to 2.0	✓	✓	✓		Above fill
2.0 to 4.0	✓	✓	✓		Within fill
4.0 to 5.0	✓	✓	✓		Within fill
<b>SB-GD-02</b>					
0 to 1.0	✓	✓	✓		Above fill
2.5 to 4.0	✓	✓	✓		Within fill
5 to 6.5	✓	✓	✓		Within fill
7.0 to 8.0	✓	✓			Below fill
<b>SB-GD-03</b>					
0 to 0.5	✓	✓			Outside fill area
0.5 to 1.0	✓				Outside fill area
1.0 to 2.0	✓	✓			Outside fill area
2.0 to 3.0	✓				Outside fill area
4.0 to 5.0	✓				Outside fill area
7.5 to 8.5	✓				Outside fill area
<b>SB-GD-04</b>					
0 to 1.0	✓	✓			Outside fill area
1.0 to 2.0	✓	✓			Outside fill area
2.0 to 3.5	✓	✓			Outside fill area
4.0 to 5.0	✓				Outside fill area
6.0 to 8.0	✓	✓			Outside fill area

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Table 3. Summary of Metals Exceedance Concentrations in Test Pit Soil Samples Grove Site																
Test Pit ID		Aluminum	Antimony	Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Vanadium	Zinc
Sample Depth (ft bgs)	Description															
<b>TP-GD-07</b>																
0 to 0.5	Above fill		✓	✓			✓	✓	✓	✓		✓	✓			
0.5 to 1.0	Above fill			✓			✓			✓						
1.0 to 2.0	Above fill			✓			✓			✓						
3.0 to 4.0	Within fill			✓			✓		✓	✓	✓		✓			
<b>TP-GD-08</b>																
0 to 0.5	Above fill			✓			✓	✓		✓		✓				
1.0 to 1.25	Within fill		✓	✓			✓	✓		✓	✓	✓			✓	
1.25 to 2.0	Within fill	✓	✓	✓			✓	✓		✓						
3.0 to 4.0	Within fill			✓			✓	✓	✓	✓			✓		✓	
<b>TP-GD-09</b>																
0 to 0.5	No fill observed	✓	✓	✓			✓	✓		✓		✓				
0.5 to 1.0	No fill observed			✓			✓	✓		✓		✓				
1.0 to 2.0	No fill observed			✓			✓			✓	✓					
2.0 to 3.0	No fill observed			✓			✓		✓				✓			
4.0 to 5.0	No fill observed						✓									
<b>TP-GD-10</b>																
0 to 0.5	Above fill			✓			✓			✓						
0.5 to 1.0	Above fill		✓	✓			✓	✓	✓	✓	✓	✓	✓			
1.0 to 2.0	Within fill	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.0 to 4.0	Within fill	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓		✓
5.0 to 6.0	Below fill			✓			✓									
<b>TP-GD-11</b>																
0 to 0.5	Above fill		✓	✓			✓	✓		✓		✓				
0.5 to 1.0	Above fill			✓			✓		✓	✓		✓	✓			
1.0 to 2.0	Above fill		✓	✓			✓	✓		✓	✓	✓				
3.5 to 4.0	Within fill		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5.0 to 6.0	Within fill		✓	✓			✓	✓	✓	✓	✓	✓	✓			
6.0 to 7.0	Within fill		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
<b>TP-GD-12</b>																
0 to 0.5	Above fill		✓	✓			✓	✓		✓		✓				
0.5 to 1.0	Above fill			✓			✓		✓	✓	✓		✓			
1.0 to 2.0	Within fill		✓	✓			✓			✓	✓				✓	
2.0 to 4.0	Within fill	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	
4.0 to 6.0	Within fill	✓	✓	✓			✓	✓		✓		✓	✓			
6.0 to 7.0	Below fill		✓	✓			✓	✓	✓	✓		✓				

✓ = Exceeds USEPA Residential RSL; Shaded cells exceed EPA Industrial RSL

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Table 4. Summary of Metals Exceedance Concentrations in Test Pit Soil Samples Grove Dump Site															
Soil Boring ID		Aluminum	Antimony	Arsenic	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Thallium	Vanadium	Zinc
Sample Depth (ft bgs)	Description														
<b>SB-GD-01</b>															
0 to 1.0	Above fill	✓		✓	✓	✓		✓		✓		✓	✓	✓	
1.0 to 2.0	Above fill	✓		✓	✓	✓		✓		✓					
2.0 to 4.0	Within fill			✓	✓	✓		✓	✓	✓					
4.0 to 5.0	Within fill		✓	✓	✓		✓	✓	✓		✓				✓
<b>SB-GD-02</b>															
0 to 1.0	Above fill			✓	✓					✓					
2.5 to 4.0	Within fill			✓	✓		✓	✓			✓				
5.0 to 6.5	Within fill			✓	✓	✓	✓	✓	✓	✓	✓				
7.0 to 8.0	Below fill			✓	✓			✓							✓
<b>SB-GD-03</b>															
0 to 0.5	Outside fill area			✓	✓	✓		✓		✓					
0.5 to 1.0	Outside fill area			✓	✓			✓		✓					
1.0 to 2.0	Outside fill area	✓		✓	✓			✓							
2.0 to 3.0	Outside fill area			✓	✓										
4.0 to 5.0	Outside fill area	✓		✓	✓	✓		✓							✓
7.5 to 8.5	Outside fill area			✓	✓			✓							✓
<b>SB-GD-04</b>															
0 to 1.0	Outside fill area			✓	✓	✓		✓		✓					
1.0 to 2.0	Outside fill area			✓	✓			✓		✓					
2.0 to 3.5	Outside fill area			✓	✓			✓							
4.0 to 5.0	Outside fill area			✓	✓										
6.0 to 8.0	Outside fill area			✓	✓										

✓ = Exceeds USEPA Residential RSL; Shaded cells exceed USEPA Industrial RSL

**LABORATORY DATA - GROUNDWATER**

Groundwater was generally observed to be between 5 and 8 feet below ground surface.

The contractor installed four monitoring wells onsite as part of this investigation. Table 5 provides a summary of the wells:

<b>Monitoring Well</b>	<b>Total Depth (ft bgs)</b>	<b>Screened Interval (ft bgs)</b>	<b>Northing (ft)</b>	<b>Easting (ft)</b>	<b>Top of Casing Elevation (ft amsl)</b>	<b>Well Permit No.</b>
MW-GD-01	13	3 to 13	496107.38	922231.08	10.29	AA-16-0279
MW-GD-02	15	5 to 15	496035.83	922585.53	19.46	AA-16-0280
MW-GD-03	15	5 to 15	495963.58	922942.44	21.74	AA-16-0281
MW-GD-04	15	5 to 15	496186.26	922508.53	21.81	AA-16-0282

Below is a summary of groundwater sample results:

- One groundwater sample, collected from MW-GD-01, contained a concentration of naphthalene (a PAH) which exceeded the USEPA Tap Water RSL.
- Despite the presence of additional PAHs, PCBs, and pesticides in soil, they do not appear to have impacted groundwater at this time. These contaminants remain largely bound to the soil.
- Concentrations of eleven separate metals in excess of USEPA and/or MDE action levels were observed at one or more monitoring wells. Sample fractions were collected for both total and dissolved metals. Exceedances of seven of these metals were observed only at the wells located within the fill material and are believed to represent onsite contamination resulting from the fill. These include antimony, cadmium, chromium, copper, mercury, vanadium, and zinc. The three other metals (aluminum, iron, and manganese) which exceeded USEPA and/or MDE action levels were observed both within and outside the fill and are likely the result of natural background conditions.

Table 6 provides a summary of metal exceedances observed within groundwater.

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Table 6. Summary of Groundwater Results for Metals Grove Dump Site					
Metal	MW-GD-01	MW-GD-02	D-GD-08	MW-GD-03	MW-GD-04
Aluminum (total)	ND	0.067 J	0.08 J	0.12	0.11
Aluminum (dissolved)	ND	ND	0.038 J	ND	0.053 J
Antimony (total)	0.015	0.0093	0.0093	ND	ND
Antimony (dissolved)	0.013	0.0094	0.0093	ND	ND
Arsenic (total)	0.056	0.0012 J	ND	0.067	ND
Arsenic (dissolved)	0.094	0.0011 J	ND	0.067	ND
Cadmium (total)	0.015	0.00039 J	ND	ND	0.00039 J
Cadmium (dissolved)	0.011 J	ND	ND	ND	0.00040 J
Chromium (total)	0.26	0.067	0.068	0.0017 J	0.0037
Chromium (dissolved)	0.042	0.053	0.063	0.0011 J	ND
Copper (total)	1.3	0.54	0.52	0.0027 J	0.004 J
Copper (dissolved)	0.86	0.40	0.43	0.0027 J	0.0048 J
Iron (total)	4.4	5.8	6.8	46	0.35
Iron (dissolved)	7.9	6.3	5.3	47.5	0.34
Manganese (total)	0.15	0.14	0.14	2.1	0.082
Manganese (dissolved)	0.2	0.14	0.14	2.1	0.11
Mercury (total)	0.0031	0.026	0.028	ND	ND
Mercury (dissolved)	0.0018	0.0091	0.022	ND	ND
Vanadium (total)	0.43	0.081	0.08	0.0029	0.0025
Vanadium (dissolved)	0.27	0.073	0.08	0.0016 J	0.0023
Zinc (total)	3.5	0.77	0.75	0.0049 J	0.027
Zinc (dissolved)	3.2	0.74	0.77	0.0052 J	0.029

All results in mg/L; ND = not detected; J = estimated value

Red: Exceeds MDE action levels; Bold: Exceeds USEPA action levels; Red and Bold: Exceeds both MDE and USEPA action levels