ATTACHMENT 3. TEST PIT FIELD FORMS

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-1

Date: November 10, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-1

Pit Boundaries (Nothing, Easting)

Corner 1

X: 1322595.989

Y: 447339.42

Corner 2

X: 1322600.941

Y: 447336.7007

Corner 3

X: 1322590.471

Y: 447308.6907

Corner 4

X: 1322578.938

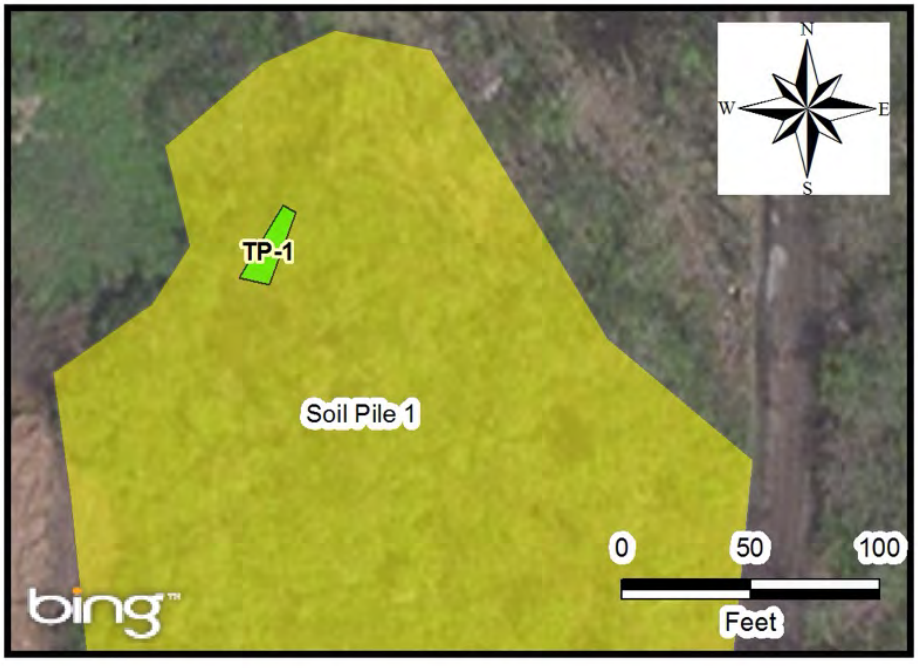
Y: 447311.3677

Pit Dimensions:

Length (ft): 18

Width (ft): 10

Depth (ft): 12



Excavation Descriptions

Primarily medium brown silty sand with large well rounded gravel. Steel rebar noted on northern wall at 1 foot in depth. Additional rebar noted at 7 feet in depth.

Odor: None

PID: 0.0

☒ Sample collected

☒ Debris observed

Same soil with plastic trash at 1 foot bgs brick and concrete noted at approximately 6 feet bgs. Same material as the west wall.

Odor: None

PID: 0.0

☒ Sample collected

☒ Debris observed

Concrete and rebar noted at 5 feet bgs. Plywood material at 6 feet bgs. No odor or staining. Sheet metal observed at 2 to 3 feet bgs.

Odor: None

PID: 0.0

☒ Sample collected

☒ Debris observed

No clear interface between pile material and dredge material here but trash and concrete appear mostly above 7 feet in depth.

Odor: None

PID: 0.0

☒ Sample collected

☐ Debris observed

End of test pit at 12 feet in depth.

Odor: —

PID: 0.0

☐ Sample collected

☐ Debris observed

Photo 1: Overall view of Test Pit 1.

Photo 2: Metal debris within two feet of surface.

Photo 3: Northwestern wall.

Photo 4: Rebar noted at two feet and seven feet in depth.

Photo 5: Eastern wall.

Photo 6: Typical material encountered.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-2

Date: November 10, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-1

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322545.202	X:	1322544.877
Y:	447208.5722	Y:	447221.7863

Corner 3		Corner 4	
X:	1322572.009	X:	1322571.176
Y:	447224.8385	Y:	447203.9844

Pit Dimensions:

Length (ft): 20

Width (ft): 14

Depth (ft): 14

Excavation Descriptions

East wall consists of medium brown silly clay with well rounded cobbles and some large boulders. Asphalt pieces at 3 to 5 feet. Concrete and rebar noted from 5 to 10 feet.

Odor: None

PID: 0.0

☒ Sample collected

☒ Debris observed

Similar material as above, with increasing wood and concrete debris beginning at 4 feet in depth. Corrugated metal debris noted at approximately 8 feet.

Odor: None

PID: 0.1

☒ Sample collected

☒ Debris observed

Bottom of the pit at approximately 14 feet showed signs of dark staining. Material consisted of light grey silty clay with slight petrochemical odor and slight PID reading.

Odor: Petrochemical

PID: 3.7

☒ Sample collected

☒ Debris observed

End of test pit at 14 feet in depth.

Odor: —

PID: 0.0

☐ Sample collected

☐ Debris observed

Odor: —

PID:

☐ Sample collected

☐ Debris observed

Photo 1: Eastern wall.

Photo 2: Corrugated metal debris at 8 feet in depth.

Photo 3: Excavated material has wood, asphalt, and concrete.

Photo 4: Grey staining begins at 10 feet and down to 14 feet.

Photo 5: West wall showing asphalt and concrete beginning at 10 feet.

Photo 6: South wall of test pit.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-3

Date: November 10, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-1

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322697.758	X:	1322693.63
Y:	447191.6366	Y:	447203.7408

Corner 3		Corner 4	
X:	1322708.319	X:	1322716.924
Y:	447216.3958	Y:	447205.3645

Pit Dimensions:

Length (ft): 15

Width (ft): 10

Depth (ft): 14

Excavation Descriptions

Surface to 3 feet consists of medium brown silty clay with well rounded cobbles. Debris including concrete pieces, brick, wood, and asphalt noted beginning at 3 feet in depth.	Odor: None PID: 0.0 ☐ Sample collected ☒ Debris observed	
Below 4 feet consists of medium grey clayey gravel quickly trending to a grey gravelly sand.	Odor: None PID: 0.0 ☒ Sample collected ☒ Debris observed	
Grey gravelly material contains approximately 10 percent concrete, asphalt, and smaller amounts (2 percent) of glass, metal, ceramic tile, and terra cotta pieces down to the bottom of the pit at 14 feet.	Odor: Petrochemical PID: 0.0 ☒ Sample collected ☒ Debris observed	
At approximately 7 to 8 feet in depth a petrochemical odor was noticed in the breathing zone nearby the pit. Work stopped while air monitoring took place but no source could be identified other than the pit itself. Test pitting resumed once odor cleared.	Odor: Petrochemical PID: 0.0 ☒ Sample collected ☒ Debris observed	
End of test pit at 14 feet in depth.	Odor: — PID: 0.0 ☐ Sample collected ☐ Debris observed	

Photo 1: Debris noted beginning at about 5 feet.

Photo 2: Dark staining noted at about 5 feet in depth.

Photo 3: West wall of excavation.

Photo 4: Southern wall of excavation.

Photo 5: Western wall and bottom of pit.

Photo 6: Debris removed from pit.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-4

Date: November 10, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-1

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322794.746	X:	1322808.983
Y:	447125.7587	Y:	447119.2753

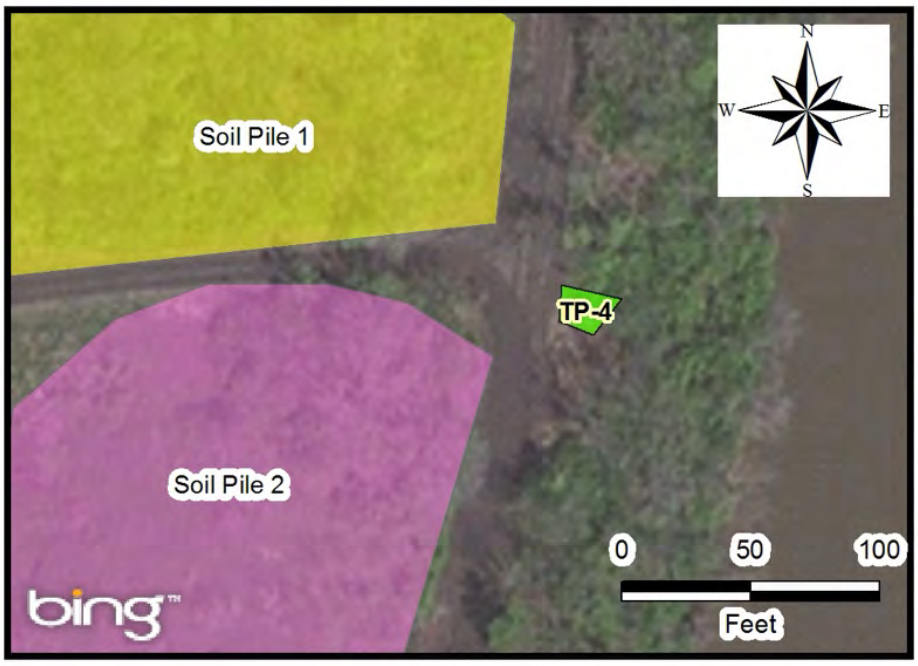
Corner 3		Corner 4	
X:	1322818.983	X:	1322795.644
Y:	447134.4377	Y:	447139.9285

Pit Dimensions:

Length (ft): 18

Width (ft): 10

Depth (ft): 13



Excavation Descriptions

Top 2 feet consist of black to dark grey silty material with large amounts of brick, terra cotta, and concrete debris.

Odor: None

PID: 0.1

☒ Sample collected

☒ Debris observed

The material from 2 to 4 feet consist of medium grey gravelly silt with little debris.

Odor: None

PID: 0.0

☐ Sample collected

☒ Debris observed

---

4 feet and deeper back into debris that includes asphalt, textiles, styrofoam, and plastic down to approximately 10 feet.

Odor: Petrochemical

PID: 0.0

☒ Sample collected

☒ Debris observed

A significant glass layer at 10 feet. Mostly glass with metal debris including what appears to be a car battery at this depth.

Odor: Petrochemical

PID: 0.1

☒ Sample collected

☒ Debris observed

Water flowing into excavation below 10 feet. Material removed below glass layer has petrochemical odor and slight staining. Consists of light to medium grey silty clay with well rounded cobbles and brick. End of test pit at 13 feet in depth.

Odor: Petrochemical

PID: 0.0

☒ Sample collected

☒ Debris observed

Photo 1: Concrete brick and asphalt throughout.

Photo 2: Southeastern wall of test pit at 10 feet.

Photo 3: Eastern wall of test pit.

Photo 4: Northeastern wall of test pit.

Photo 5: Water flowing into excavation below 10 feet.

Photo 6: West wall of test pit.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-5

Date: November 11, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-2

Pit Boundaries (Nothing, Easting)

Corner 1

X: 1322612.268

Y: 446881.4785

Corner 2

X: 1322622.354

Y: 446882.7018

Corner 3

X: 1322629.57

Y: 446860.8812

Corner 4

X: 1322621.997

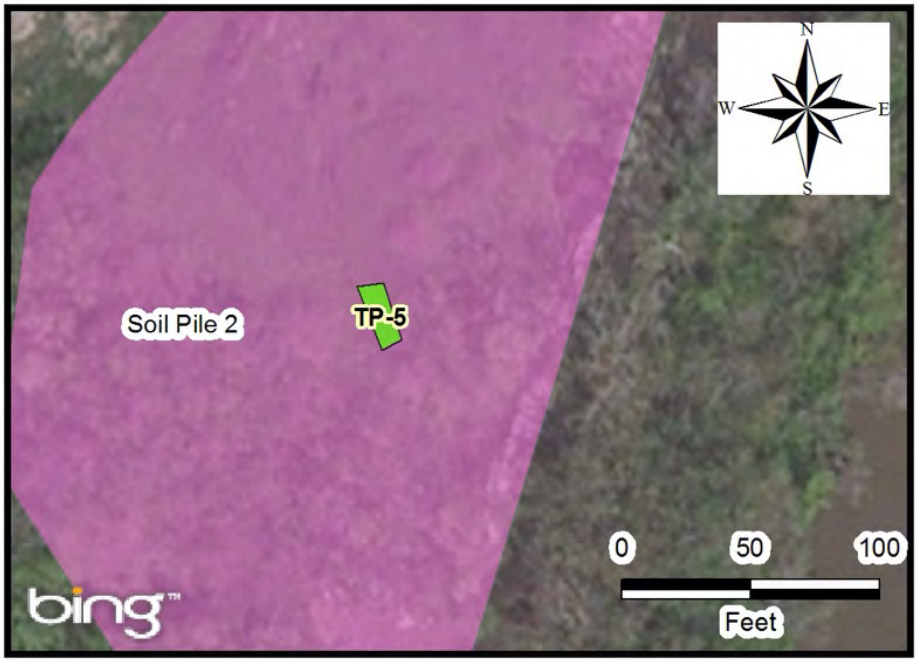
Y: 446856.76

Pit Dimensions:

Length (ft): 18

Width (ft): 12

Depth (ft): 18



Excavation Descriptions

Top 6 feet of material consists of compost type material with large amounts of household rubbish and plastic debris.

Odor: Biological

PID: 0.3

☒ Sample collected

☒ Debris observed

Wet leafy layer from 6 to 8 feet back into dryer compost and trash below 8 feet.

Odor: Biological

PID: 0.0

☒ Sample collected

☒ Debris observed

From 8 to 12 feet the material is similar to the top 6 feet with larger pieces of debris. Debris consists of tires, concrete, and wood. Slight petrochemical odor in this layer.

Odor: Petrochemical

PID: 0.9

☒ Sample collected

☒ Debris observed

Below 12 feet in depth is a light to medium brown silty clay with well rounded gravel. Contains less plastic trash but we did observed one large piece of concrete with rebar. Same down to 18 feet.

Odor: Petrochemical

PID: 0.3

☒ Sample collected

☒ Debris observed

End of test pit at 18 feet in depth.

Odor: —

PID: 0.0

☐ Sample collected

☐ Debris observed

Photo 1: North wall.

Photo 2: West wall.

Photo 3: South wall.

Photo 4: East wall.

Photo 5: Excavated material showing compost material and debris.

Photo 6: Excavated material showing common trash and plastic debris.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-6

Date: November 11, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-2

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322599.902	X:	1322585.518
Y:	446743.9921	Y:	446749.012

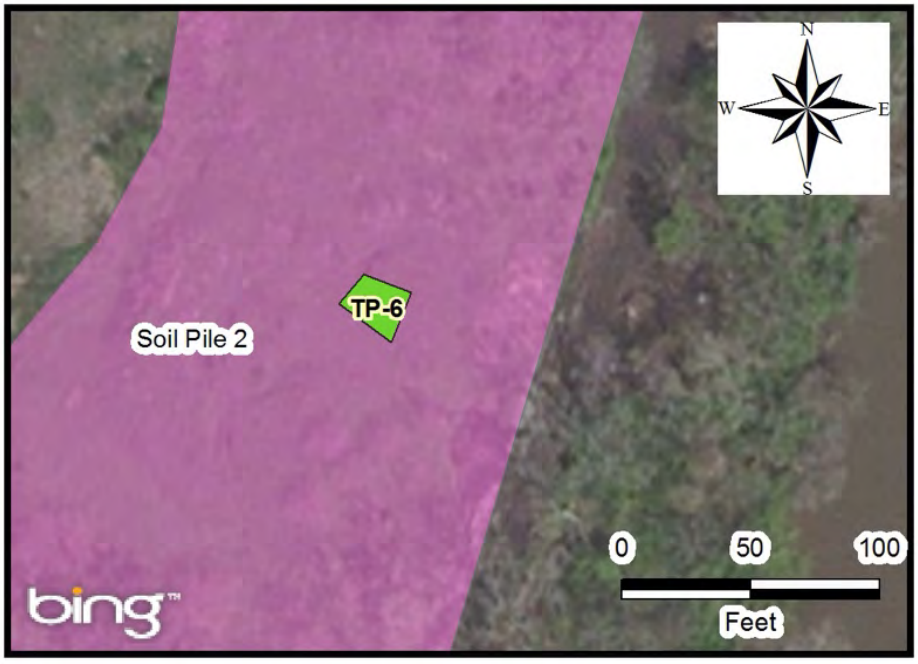
Corner 3		Corner 4	
X:	1322587.253	X:	1322599.297
Y:	446772.3203	Y:	446770.3442

Pit Dimensions:

Length (ft): 15

Width (ft): 14

Depth (ft): 18



Excavation Descriptions

Dark brown silty organics with plastic trash and glass down to 6 feet.	Odor: None PID: 0.0 ☒ Sample collected ☒ Debris observed
Below 6 feet, a layer of medium brown silty sand with gravel and large blocks of concrete with wood and metal piping.	Odor: None PID: 0.5 ☒ Sample collected ☒ Debris observed
Same material to the bottom of the test pit at 18 feet. Mostly construction debris like concrete and asphalt pieces.	Odor: None PID: 0.0 ☒ Sample collected ☒ Debris observed
End of test pit at 18 feet in depth.	Odor: — PID: ☐ Sample collected ☐ Debris observed
	Odor: — PID: ☐ Sample collected ☐ Debris observed

Photo 1: Test pit being excavated.

Photo 2: North wall showing organics interface with construction debris.

Photo 3: Bottom of excavation.

Photo 4: South wall.

Photo 5: Excavated material consists of construction debris mixed with organic soil.

Photo 6: North wall.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-7

Date: November 11, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-2

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322645.089	X:	1322654.867
Y:	446978.6831	Y:	446989.9269

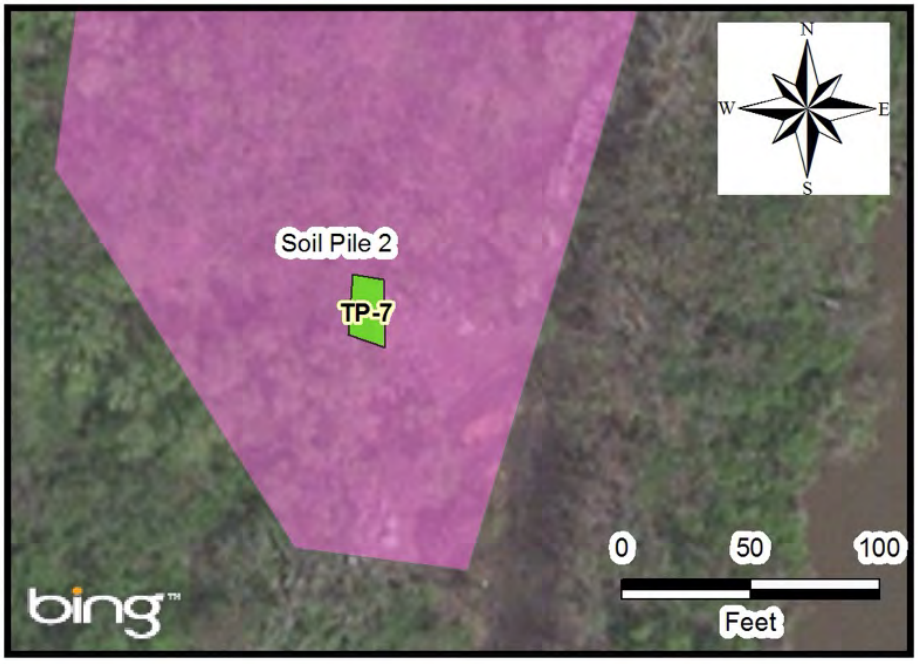
Corner 3		Corner 4	
X:	1322673.295	X:	1322665.606
Y:	446982.7492	Y:	446963.3775

Pit Dimensions:

Length (ft): 16

Width (ft): 10

Depth (ft): 25



Excavation Descriptions

Organics and trash visible In the top 2 feet mixed with silty sand with gravel.

Odor: None

PID: 0.0

☒ Sample collected

☒ Debris observed

Below 2 feet in depth material consists of a medium brown sandy gravel with well rounded cobbles and gravel. No trash or debris of any kind noted below 2 feet in depth.

Odor: None

PID: 0.0

☒ Sample collected

☐ Debris observed

Same as above down to 25 feet in depth.

Odor: None

PID: 0.0

☒ Sample collected

☐ Debris observed

End of test pit at 25 feet in depth.

Odor: —

PID:

☐ Sample collected

☐ Debris observed

Odor: —

PID:

☐ Sample collected

☐ Debris observed

Photo 1: West wall.

Photo 2: North wall.

Photo 3: East wall.

Photo 4: South wall.

Photo 5: Typical shallow organics.

Photo 6: Typical material below 2 feet in depth.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-8

Date: November 11, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-2

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322752.082	X:	1322752.655
Y:	446917.1613	Y:	446903.5968

Corner 3		Corner 4	
X:	1322778.098	X:	1322777.295
Y:	446899.7328	Y:	446916.418

Pit Dimensions:

Length (ft): 20

Width (ft): 12

Depth (ft): 10

Excavation Descriptions

Top 2 feet of material contains a variety of debris including a 55 gallon drum, brick, and styrofoam. No odor or staining was noted adjacent to the 55 gallon drum when excavated

Odor: None

PID: 0.2

☒ Sample collected

☒ Debris observed

Below 2 feet the material consists of medium brown silty sand with well rounded gravel and cobbles. With less debris (10 percent) including asphalt, concrete, and a tire.

Odor: None

PID: 0.0

☒ Sample collected

☒ Debris observed

End of test pit at 10 feet in depth.

Odor: —

PID:

☐ Sample collected

☐ Debris observed

Odor: —

PID:

☐ Sample collected

☐ Debris observed

Odor: —

PID:

☐ Sample collected

☐ Debris observed

Photo 1: Initial excavation.

Photo 2: Portions of a 55 gallon drum.

Photo 3: North wall showing tire inter tube and asphalt.

Photo 4: West wall.

Photo 5: South wall.

Photo 6: Excavation viewed looking east.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-9

Date: November 11, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-3

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322195.241	X:	1322198.227
Y:	444964.3058	Y:	444978.4246

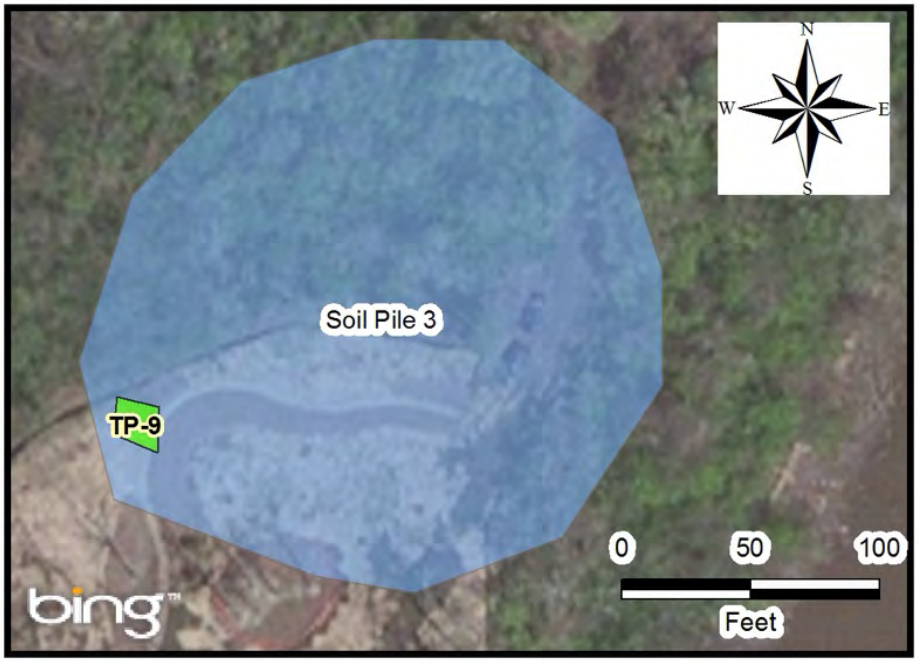
Corner 3		Corner 4	
X:	1322179.823	X:	1322175.391
Y:	444982.4114	Y:	444964.4504

Pit Dimensions:

Length (ft): 15

Width (ft): 10

Depth (ft): 12



Excavation Descriptions

0 to 4 feet consists of dark brown silty clay with small amounts of asphalt and concrete.	Odor:	None
	PID:	0.0
	☒ Sample collected	
	☒ Debris observed	
4 to 10 feet consists of medium grey silty clay with larger percentage of trash including aluminum cans, and textiles.	Odor:	None
	PID:	0.0
	☒ Sample collected	
	☒ Debris observed	
Below 10 feet, the material consists of a black layer with large amounts of trash including paint cans. Moist Layer with dark asphalt to bottom of pit at 12 feet.	Odor:	Petrochemical
	PID:	0.5
	☒ Sample collected	
	☒ Debris observed	
End of test pit at 12 feet in depth.	Odor:	—
	PID:	
	☐ Sample collected	
	☐ Debris observed	
	Odor:	—
	PID:	
	☐ Sample collected	
	☐ Debris observed	

Photo 1: West wall.

Photo 2: North Wall.

Photo 3: East wall.

Photo 4: South wall.

Photo 5: Typical debris below 4 feet.

Photo 6: Typical debris consisting of metal cans, wire, and paint cans.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-10

Date: November 11, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-3

Pit Boundaries (Nothing, Easting)

Corner 1

X: 1322137.209

Y: 445092.7499

Corner 2

X: 1322134.608

Y: 445071.0447

Corner 3

X: 1322140.276

Y: 445073.9944

Corner 4

X: 1322149.399

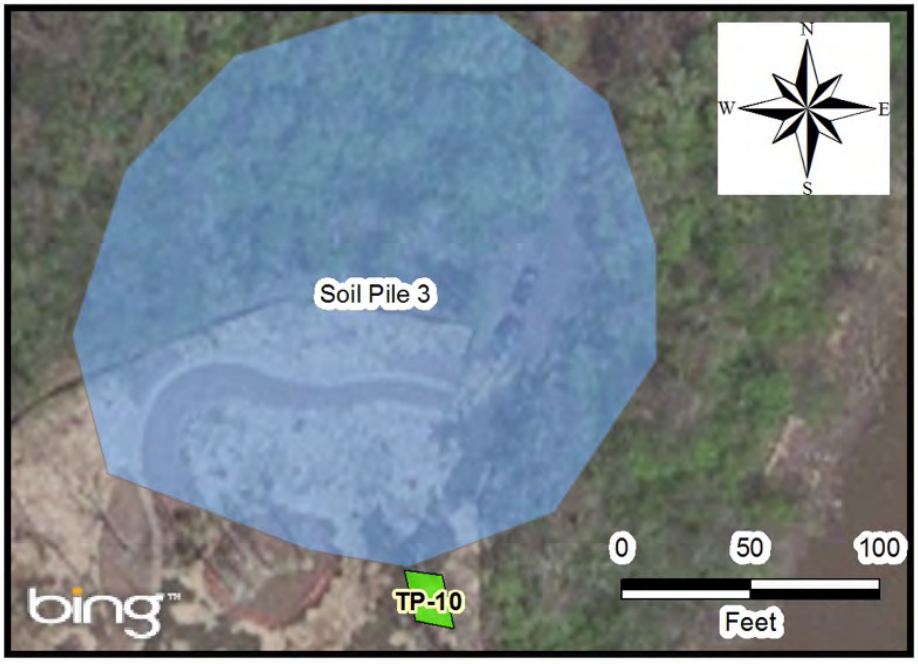
Y: 445094.549

Pit Dimensions:

Length (ft): 18

Width (ft): 10

Depth (ft): 12



Excavation Descriptions

Organic layer for approximately 6 inches then medium brown silty sand with debris including concrete, wood, rebar, and brick. Down to approximately 7 feet	Odor: Petrochemical PID: 1.7 ☒ Sample collected ☒ Debris observed
Below 7 feet grey silty clay with large amounts (20 percent) of debris including rope, railroad ties, metal wheels, and concrete to 10 feet. Grey clay has black staining in places which register on the PID in the 20 ppm range. Slight petrochemical odor.	Odor: Petrochemical PID: 23.5 ☒ Sample collected ☒ Debris observed
10 feet and below consists of dark grey gravelly sand with well rounded river cobbles. Some concrete and rebar noted.	Odor: Petrochemical PID: 13.4 ☒ Sample collected ☒ Debris observed
End of test pit at 12 feet in depth.	Odor: — PID: ☐ Sample collected ☐ Debris observed
	Odor: — PID: ☐ Sample collected ☐ Debris observed

Photo 1: Rebar and railroad tie at 4 feet in depth.

Photo 2: East wall.

Photo 3: North wall showing wooden pole and railroad tie.

Photo 4: West wall.

Photo 5: South wall.

Photo 6: Common debris noted in test pit.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-11

Date: November 12, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-3

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322121.593	X:	1322125.942
Y:	444855.9941	Y:	444840.995

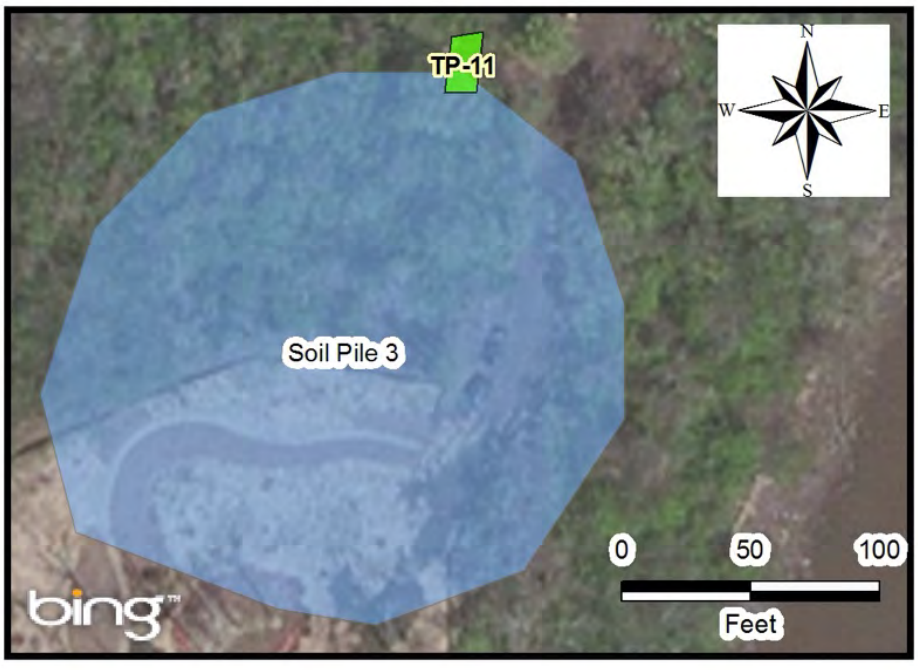
Corner 3		Corner 4	
X:	1322110.838	X:	1322106.576
Y:	444844.22	Y:	444863.707

Pit Dimensions:

Length (ft): 18

Width (ft): 12

Depth (ft): 15



Excavation Descriptions

Top soil horizon consists of organics and medium brown silty sand with moderately well rounded gravels and large boulders down to 3 feet.	Odor:	None
	PID:	0.1
	☒ Sample collected	
	☐ Debris observed	
Below 3 feet, large slabs of concrete, asphalt, and brick mixed in with medium brown coarse sand and large river cobbles.	Odor:	None
	PID:	0.2
	☒ Sample collected	
	☒ Debris observed	
At 8 feet the material transitions to a medium grey silty clay with river cobbles. Asphalt, brick, concrete, glass, ceramic tiles, and tarry asphalt like material. Petrochemical odor noted here and PID readings in the 10 to 20 ppm range.	Odor:	Petrochemical
	PID:	22.6
	☒ Sample collected	
	☒ Debris observed	
Down to 15 feet material is consistently grey to medium brown silty clay with inclusions of construction debris like brick, glass, wood and concrete.	Odor:	Petrochemical
	PID:	17.2
	☒ Sample collected	
	☒ Debris observed	
End of test pit at 15 feet in depth.	Odor:	—
	PID:	
	☐ Sample collected	
	☐ Debris observed	

Photo 1: West wall of test pit during excavation.

Photo 2: Typical material from test pit.

Photo 3: South wall.

Photo 4: West wall.

Photo 5: Northwest wall.

Photo 6: East wall.

Kingman Island Investigation

Project Number: 103S3636.014.03

Test Pit ID: TP-12

Date: November 12, 2015

Tetra Tech Personnel : Ryan Murley

Test Pit Composite ID: Soil Pile-3

Pit Boundaries (Nothing, Easting)

Corner 1		Corner 2	
X:	1322008.398	X:	1321991.088
Y:	444918.9693	Y:	444926.2914

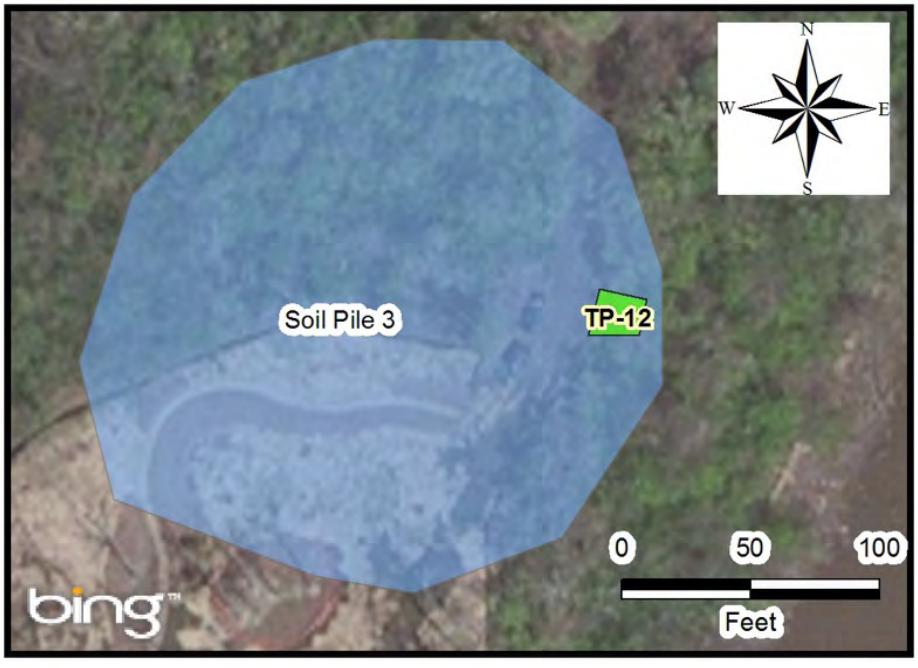
Corner 3		Corner 4	
X:	1321992.704	X:	1322009.19
Y:	444940.804	Y:	444936.8465

Pit Dimensions:

Length (ft): 18

Width (ft): 11

Depth (ft): 20



Excavation Descriptions

Surface material consists of black organic silts with a large amount (10 percent) of glass and ceramic material. Down to approximately 3 feet.

Odor: None
PID: 0.1
☒ Sample collected
☒ Debris observed

Below 3 feet the material transitions into a medium brown silty clay with less glass and ceramic debris. Still some metal and concrete noted here and down to approximately 9 feet.

Odor: None
PID: 0.1
☒ Sample collected
☒ Debris observed

At 9 feet in depth the material consists of a medium grey silty clay with well rounded cobbles and brick debris.

Odor: Petrochemical
PID: 0.5
☒ Sample collected
☒ Debris observed

At 12 feet material consists of a dark brown sandy silt with gravel and a large percentage (20 percent) of construction debris including brick, terra cotta, coal slag, and additional trash including a rusty metal bucket. Petrochemical odor noted in breathing zone.

Odor: Petrochemical
PID: 9.7
☒ Sample collected
☒ Debris observed

At 18 feet the material transitioned to a light brown to tan silty clay with white ash like silty material combined with brick and glass. End of test pit at 20 feet in depth.

Odor: Petrochemical
PID: 0.0
☒ Sample collected
☒ Debris observed

Photo 1: Typical excavated material.

Photo 2: East wall.

Photo 3: South wall.

Photo 4: Southwest wall.

Photo 5: North wall.

Photo 6: Material from the bottom of the pit.

ATTACHMENT 4. ANALYTICAL SUMMARY TABLES

TABLE 1: SOIL SAMPLE ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	VOCs (mg/kg) by EPA Method 8260C	
					Carbon disulfide	Toluene
SB-1	*SB-1-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	ND	1.4 J
SB-1	*SB-1D-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND
SB-1	*SB-1-(12-14)*	12-14 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND
SB-2	*SB-2-(1-3)*	1-3 feet	11/10/2015	West of Soil Pile 1	ND	ND
SB-2	*SB-2-(8-10)*	8-10 feet	11/10/2015	West of Soil Pile 1	ND	ND
SB-3	*SB-3-(1-3)*	1-3 feet	11/10/2015	Southwest of Soil Pile 1	ND	ND
SB-3	*SB-3-(11-13)*	11-13 feet	11/10/2015	Southwest of Soil Pile 1	ND	ND
SB-4	*SB-4-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-4	*SB-4-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-5	*SB-5-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-5	*SB-5-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-6	*SB-6-(1-3)*	1-3 feet	11/10/2015	East of Soil Pile 1	ND	ND
SB-6	*SB-6-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	ND	ND
SB-6	*SB-6D-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	ND	ND
SB-7	*SB-7-(1-3)*	1-3 feet	11/11/2015	Southwest of Soil Pile 2	ND	ND
SB-7	*SB-7-(8-10)*	8-10 feet	11/11/2015	Southwest of Soil Pile 2	ND	ND
SB-8	*SB-8-(1-3)*	1-3 feet	11/11/2015	Northwest of Soil Pile 2	ND	ND
SB-8	*SB-8-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	ND	ND
SB-8	*SB-8D-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	ND	ND
SB-9	*SB-9(1-3)*	1-3 feet	11/11/2015	North-northeast of Soil Pile 2	ND	ND
SB-9	*SB-9-(12-14)*	12-14 feet	11/11/2015	North-northeast of Soil Pile 2	ND	ND
SB-10	*SB-10- (1-3)*	1-3 feet	11/11/2015	East of Soil Pile 2	ND	ND
SB-10	*SB-10-(8-10)*	8-10 feet	11/11/2015	East of Soil Pile 2	ND	ND
SB-11	*SB-11-(1-3)*	1-3 feet	11/11/2015	South-southeast of Soil Pile 2	ND	ND
SB-11	*SB-11-(8-10)*	8-10 feet	11/11/2015	South-southeast of Soil Pile 2	ND	ND
SB-12	*SB-12-(1-3)*	1-3 feet	11/11/2015	South of Soil Pile 2	ND	ND
SB-12	*SB-12-(8-10)*	8-10 feet	11/11/2015	South of Soil Pile 2	ND	ND
SB-13	*SB-13-(1-3)*	1-3 feet	11/11/2015	North of Soil Pile 3	ND	ND
SB-13	*SB-13-(13-15)*	8-10 feet	11/11/2015	North of Soil Pile 3	ND	ND
SB-14	*SB-14-(1-3)*	1-3 feet	11/12/2015	Northeast of Soil Pile 3	ND	ND
SB-14	*SB-14-(13-15)*	13-15 feet	11/12/2015	Northeast of Soil Pile 3	ND	ND

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	VOCs (mg/kg) by EPA Method 8260C	
					Carbon disulfide	Toluene
SB-15	*SB-15-(1-3)*	1-3 feet	11/12/2015	Southwest of Soil Pile 3	ND	ND
SB-15	*SB-15-(12-14)*	12-14 feet	11/12/2015	Southwest of Soil Pile 3	ND	ND
SB-16	*SB-16-(1-3)*	1-3 feet	11/12/2015	Center of Soil Pile 3	ND	ND
SB-16	*SB-16-(7-9)*	7-9 feet	11/12/2015	Center of Soil Pile 3	ND	ND
SB-17	*SB-17-(1-3)*	1-3 feet	11/11/2015	Southeastern portion of Soil Pile 3	0.00084 J	ND
SB-17	*SB-17-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	ND	ND
SB-17	*SB-17D-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	ND	ND
SB-18	*SB-18-(1-3)*	1-3 feet	11/11/2015	Eastern portion of Soil Pile 3	ND	ND
SB-18	*SB-18-(13-15)*	13-15 feet	11/11/2015	Eastern portion of Soil Pile 3	ND	0.00066 J
EPA Residential Soil RSL*					**77**	**490**
EPA Industrial Soil RSL*					**350**	**4700**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*					**NS**	**6230**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*					**NS**	**58000**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*					**NS**	**81100**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Child*					**NS**	**321000**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Adult*					**NS**	**321000**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Commercial Worker*					**NS**	**449000**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, *District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9, and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker* , dated June 2011 and the *EPA Region 3 RSLs for Industrial Soil and Residential Soil (target hazard quotient of 0.1),* dated November 2015.

Bold results indicate the sample was above regulatory limits
DOEE - Washington DC Department of Energy & Environment
EPA - United States Environmental Protection Agency
J - Estimated Concentration
mg/kg - Milligrams per kilogram
ND - Not Detected at or above the Laboratory Detection Limit
NS - No Standard
RBSL - Risk-Based Screening Level
RSL - Regional Screening Level
VOCs - Volatile Organic Compounds

TABLE 2: SOIL SAMPLE ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	PAHs (mg/kg) by EPA Method 8270D LL															
					Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
SB-1	*SB-1-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND	0.0027	0.0081	0.010	0.011	0.0081	0.0037	0.0083	ND	0.017	ND	0.0071	ND	0.0088	0.014
SB-1	*SB-1D-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND	0.0014	0.004 J	0.0053 J	0.0056 J	0.0059 J	0.0033 J	0.0047 J	ND	0.0076	ND	0.0036 J	ND	0.0037 J	0.0069 J
SB-1	*SB-1-(12-14)*	12-14 feet	11/10/2015	Northwest of Soil Pile 1	0.100	0.070	0.290	**0.780**	**0.710**	**0.850**	0.550	0.300	0.780	**0.150**	1.4	0.110	**0.480**	0.054	0.910	1.2
SB-2	*SB-2-(1-3)*	1-3 feet	11/10/2015	West of Soil Pile 1	0.013 J	ND	0.067	**0.160**	**0.150**	0.150	0.130	0.077	0.170	ND	0.350	0.027 J	0.099	ND	0.210	0.280
SB-2	*SB-2-(8-10)*	8-10 feet	11/10/2015	West of Soil Pile 1	0.049	0.021	0.098	0.110	**0.120**	0.130	0.120	0.049	0.130	ND	0.320	0.077	0.089	0.160	0.370	0.230
SB-3	*SB-3-(1-3)*	1-3 feet	11/10/2015	Southwest of Soil Pile 1	ND	0.0066 J	0.0063 J	0.031	**0.032**	0.040	0.031	0.014	0.029	0.0066 J	0.034	0.0020 J	0.026	ND	0.015	0.028
SB-3	*SB-3-(11-13)*	11-13 feet	11/10/2015	Southwest of Soil Pile 1	0.0032 J	0.0094	0.015	0.064	**0.061**	0.073	0.056	0.027	0.065	0.015	0.130	0.0046 J	0.049	0.0033 J	0.050	0.110
SB-4	*SB-4-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	0.0052 J	0.0099	0.016	0.094	**0.094**	0.110	0.087	0.041	0.110	**0.027**	0.150	0.0059 J	0.073	0.014	0.063	0.120
SB-4	*SB-4-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	0.0018 J	0.0012 J	0.0034 J	0.013	0.0097	0.0096	0.010	0.0028 J	0.016	ND	0.022	0.0026 J	0.0064 J	ND	0.015	0.019
SB-5	*SB-5-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	0.075 J	0.660	0.530	**1.6**	**2.0**	**2.4**	2.4	0.820	1.7	**0.560**	2.7	0.110 J	**2.0**	ND	0.780	2.0
SB-5	*SB-5-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	0.0085	0.007 J	0.022	0.070	**0.065**	0.075	0.067	0.029	0.075	**0.019**	0.140	0.0096	0.055	0.0091	0.082	0.098
SB-6	*SB-6-(1-3)*	1-3 feet	11/10/2015	East of Soil Pile 1	ND	ND	0.042 J	0.110 J	**0.099 J**	0.110 J	0.100 J	0.044 J	0.130 J	ND	0.260	ND	0.100 J	ND	0.120 J	0.190
SB-6	*SB-6-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	0.0019 J	0.0047 J	0.019	0.048	**0.043**	0.042	0.037	0.023	0.046	0.0092	0.100	0.0048 J	0.034	0.0028 J	0.041	0.070
SB-6	*SB-6D-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	0.0022 J	0.0038 J	0.0085	0.023	**0.025**	0.032	0.028	0.012	0.030	0.0063 J	0.056	0.0049 J	0.024	0.0036 J	0.029	0.040
SB-7	*SB-7-(1-3)*	1-3 feet	11/11/2015	Southwest of Soil Pile 2	0.016	0.031	0.095	**0.34**	**0.29**	**0.36**	0.21	0.12	0.36	**0.064**	0.69	0.017	**0.20**	0.0083 J	0.19	0.45
SB-7	*SB-7-(8-10)*	8-10 feet	11/11/2015	Southwest of Soil Pile 2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0036 J	ND	ND	ND	ND	0.0032 J
SB-8	*SB-8-(1-3)*	1-3 feet	11/11/2015	Northwest of Soil Pile 2	0.037	0.024	0.48	**3.9**	**2.7**	**3.0**	1.8	0.91	4.6	**0.51**	6.8	0.085	**1.3**	ND	0.26	4.8
SB-8	*SB-8-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	27	0.55	57	**57**	**45**	**54**	21	**21**	**50**	**4.6**	160	34	**21**	**10**	170	120
SB-8	*SB-8D-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	3.1	0.24 J	8.8	**14**	**13**	**14**	10	**4.6**	12	**2.6**	35	3.5	**9.5**	0.96	24	22
SB-9	*SB-9(1-3)*	1-3 feet	11/11/2015	North-northeast of Soil Pile 2	0.37	0.58	1.7	**4.9**	**4.5**	**5.5**	4.6	**2.1**	5.4	**1.1**	11	0.44	**3.8**	0.24	5.7	7.4

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	PAHs (mg/kg) by EPA Method 8270D LL															
					Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
SB-9	*SB-9-(12-14)*	12-14 feet	11/11/2015	North-northeast of Soil Pile 2	0.021 J	0.068	0.097	**0.37**	**0.33**	**0.48**	0.23	0.15	0.39	**0.078**	0.56	0.029 J	**0.21**	0.038 J	0.25	0.53
SB-10	*SB-10- (1-3)*	1-3 feet	11/11/2015	East of Soil Pile 2	1.3	ND	2.8	**3.8**	**2.6**	**2.8**	1.2	0.80	4.5	**0.35**	7.8	1.5	**0.93**	0.25 J	15	11
SB-10	*SB-10-(8-10)*	8-10 feet	11/11/2015	East of Soil Pile 2	0.17	0.023	0.29	**0.42**	**0.33**	**0.43**	0.18	0.14	0.40	**0.05**	0.93	0.19	**0.16**	0.12	1.1	0.79
SB-11	*SB-11-(1-3)*	1-3 feet	11/11/2015	South-southeast of Soil Pile 2	0.065 J	ND	0.23 J	**0.90**	**0.86**	**1.1**	0.62	0.41	0.81	ND	1.7	0.060 J	**0.49**	ND	0.77	1.7
SB-11	*SB-11-(8-10)*	8-10 feet	11/11/2015	South-southeast of Soil Pile 2	0.28	0.098	1.5	**6.3**	**5.9**	**7.4**	3.7	**2.7**	6	**0.88**	11	0.37	**3.4**	0.23	5.1	9.8
SB-12	*SB-12-(1-3)*	1-3 feet	11/11/2015	South of Soil Pile 2	0.036 J	0.015 J	0.094	**0.33**	**0.34**	**0.40**	0.25	0.19	0.34	**0.051**	0.65	0.035 J	**0.21**	0.044	0.36	0.58
SB-12	*SB-12-(8-10)*	8-10 feet	11/11/2015	South of Soil Pile 2	ND	ND	0.0082 J	0.030 J	**0.042**	0.027 J	0.059	0.0081 J	0.049	ND	0.024 J	ND	0.017 J	ND	0.029 J	0.077
SB-13	*SB-13-(1-3)*	1-3 feet	11/11/2015	North of Soil Pile 3	ND	ND	0.036 J	**0.18 J**	**0.16 J**	**0.18 J**	ND	0.14 J	0.17 J	ND	0.31 J	ND	ND	ND	0.13 J	0.29 J
SB-13	*SB-13-(13-15)*	8-10 feet	11/11/2015	North of Soil Pile 3	0.36	0.073 J	0.78	**1.4**	**1.4**	**1.4**	0.89	0.78	1.4	**0.14**	3.1	0.39	**0.74**	0.29	2.9	3.1
SB-14	*SB-14-(1-3)*	1-3 feet	11/12/2015	Northeast of Soil Pile 3	0.24	0.11	0.58	**1.2**	**0.98**	**1.2**	0.67	0.51	1.2	**0.19**	2.3	0.28	**0.60**	0.19	1.8	2.1
SB-14	*SB-14-(13-15)*	13-15 feet	11/12/2015	Northeast of Soil Pile 3	0.0067 J	0.0062 J	0.031	**0.16**	**0.17**	**0.21**	0.12	0.082	0.16	**0.032**	0.23	0.0071 J	0.11	0.0082	0.082	0.21
SB-15	*SB-15-(1-3)*	1-3 feet	11/12/2015	Southwest of Soil Pile 3	0.11	0.067 J	0.29	**0.65**	**0.56**	**0.77**	0.39	0.27	0.65	**0.11**	1.5	0.12	**0.35**	0.082	0.98	1.2
SB-15	*SB-15-(12-14)*	12-14 feet	11/12/2015	Southwest of Soil Pile 3	0.015 J	0.010 J	0.040	0.12	**0.070**	0.12	0.036	0.037	0.12	0.015 J	0.32	0.019	0.031	0.029	0.18	0.26
SB-16	*SB-16-(1-3)*	1-3 feet	11/12/2015	Center of Soil Pile 3	0.110	0.110	0.34	**0.82**	**0.67**	**0.97**	0.43	0.27	0.83	**0.13**	1.7	0.091	**0.39**	0.062 J	1.4	1.4
SB-16	*SB-16-(7-9)*	7-9 feet	11/12/2015	Center of Soil Pile 3	0.014 J	0.15	0.11	**0.73**	**0.55**	**0.83**	0.36	0.28	0.70	**0.11**	0.94	0.025 J	**0.34**	0.022 J	0.17	0.81
SB-17	*SB-17-(1-3)*	1-3 feet	11/11/2015	Southeastern portion of Soil Pile 3	0.041 J	0.049 J	0.099	**0.30**	**0.31**	**0.32**	0.21	0.27	0.31	**0.057 J**	0.63	0.043 J	**0.19**	0.073 J	0.34	0.61
SB-17	*SB-17-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	0.035 J	ND	0.071 J	**0.31**	**0.30**	**0.39**	0.21	0.18	0.32	ND	0.61	0.032 J	**0.19**	ND	0.32	0.60
SB-17	*SB-17D-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	0.050 J	0.027 J	0.18	**0.72**	**0.65**	**0.97**	0.46	0.31	0.71	**0.10**	1.4	0.056 J	**0.41**	0.045 J	0.84	1.4
SB-18	*SB-18-(1-3)*	1-3 feet	11/11/2015	Eastern portion of Soil Pile 3	0.017	0.011	0.038	0.11	**0.096**	0.13	0.070	0.048	0.12	0.014	0.21	0.022	0.059	0.041	0.15	0.20
SB-18	*SB-18-(13-15)*	13-15 feet	11/11/2015	Eastern portion of Soil Pile 3	1.6	0.38	6.1	**13**	**12**	**13**	7.9	**5.8**	12	**1.9**	30	2.1	**6.9**	0.61	22	27

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	PAHs (mg/kg) by EPA Method 8270D LL															
					Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
EPA Residential Soil RSL*					**360**	**NS**	**1800**	**0.16**	**0.016**	**0.16**	**NS**	**1.6**	**16**	**0.016**	**240**	**240**	**0.16**	**3.8**	**NS**	**180**
EPA Industrial Soil RSL*					**4500**	**NS**	**23000**	**2.9**	**0.29**	**2.9**	**NS**	**29**	**290**	**0.290**	**3000**	**3000**	**2.9**	**17**	**NS**	**230**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*					**3440**	**NS**	**17200**	**0.196**	**0.0192**	**0.196**	**1870**	**9.16**	**91.5**	**NS**	**2290**	**2290**	**NS**	**469**	**1870**	**1720**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*					**28800**	**NS**	**144000**	**1.92**	**0.192**	**1.92**	**15500**	**1.92**	**191**	**NS**	**19200**	**19200**	**NS**	**262**	**15500**	**14400**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*					**33000**	**NS**	**165000**	**2.11**	**0.211**	**2.11**	**17500**	**21.00**	**210**	**NS**	**220000**	**22000**	**NS**	**322**	**17500**	**16500**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Child*					**NS**	**NS**	**NS**	**894000**	**376000**	**6190000**	**NS**	**6070000**	**15600000**	**NS**	**NS**	**NS**	**NS**	**2520**	**NS**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Adult*					**NS**	**NS**	**NS**	**224000**	**93900**	**1550000**	**NS**	**1520000**	**3890000**	**NS**	**NS**	**NS**	**NS**	**848**	**NS**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Commercial Worker*					**NS**	**NS**	**NS**	**300000**	**126000**	**2080000**	**NS**	**2040000**	**5230000**	**NS**	**NS**	**NS**	**NS**	**848**	**NS**	**NS**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9, and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker, dated June 2011 and the EPA Region 3 RSLs for Industrial Soil and Residential Soil (target hazard quotient of 0.1), dated November 2015.

Bold results indicate the sample was above regulatory limits

DOEE - Washington DC Department of Energy & Environment

D - Initial results exceeded laboratory calibration range and were run at higher dillution.

EPA - United States Environmental Protection Agency

J - Estimated Concentration

J - - Estimated Concentration, bias low

J + - Estimated Concentration, bias high

mg/kg - Milligrams per kilogram

ND - Not Detected at or above the Laboratory Detection Limit

NS - No Standard

PAHs - Polycyclic Aromatic Hydrocarbons

RBSL - Risk-Based Screening Level

RSL - Regional Screening Level

TABLE 3: SOIL SAMPLE ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	TPH (mg/kg) by EPA Method 8015D		
					Diesel Range Organics [C10 - C28]	Gasoline Range Organics [C6 - C10]	Oil Range Organics (C28-C40)
SB-1	*SB-1-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	**26**	ND	25
SB-1	*SB-1D-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	**24**	ND	21
SB-1	*SB-1-(12-14)*	12-14 feet	11/10/2015	Northwest of Soil Pile 1	11 J	ND	11 J
SB-2	*SB-2-(1-3)*	1-3 feet	11/10/2015	West of Soil Pile 1	**350**	0.057 J	**870**
SB-2	*SB-2-(8-10)*	8-10 feet	11/10/2015	West of Soil Pile 1	**140**	ND	**400**
SB-3	*SB-3-(1-3)*	1-3 feet	11/10/2015	Southwest of Soil Pile 1	**560**	ND	**940**
SB-3	*SB-3-(11-13)*	11-13 feet	11/10/2015	Southwest of Soil Pile 1	**68 J**	ND	71
SB-4	*SB-4-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	**33**	ND	37
SB-4	*SB-4-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	**30**	0.27	92
SB-5	*SB-5-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	**46**	ND	120
SB-5	*SB-5-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	**31**	ND	72
SB-6	*SB-6-(1-3)*	1-3 feet	11/10/2015	East of Soil Pile 1	**610**	ND	**830**
SB-6	*SB-6-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	9.3 J	ND	12 J
SB-6	*SB-6D-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	**13 J**	ND	58
SB-7	*SB-7-(1-3)*	1-3 feet	11/11/2015	Southwest of Soil Pile 2	**17 J**	0.059 J	38
SB-7	*SB-7-(8-10)*	8-10 feet	11/11/2015	Southwest of Soil Pile 2	10 J	ND	17 J
SB-8	*SB-8-(1-3)*	1-3 feet	11/11/2015	Northwest of Soil Pile 2	**55**	ND	180
SB-8	*SB-8-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	**310**	ND	**320**
SB-8	*SB-8D-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	**160**	ND	250
SB-9	*SB-9(1-3)*	1-3 feet	11/11/2015	North-northeast of Soil Pile 2	**45 J+**	ND	58
SB-9	*SB-9-(12-14)*	12-14 feet	11/11/2015	North-northeast of Soil Pile 2	11 J	ND	8.5 J
SB-10	*SB-10- (1-3)*	1-3 feet	11/11/2015	East of Soil Pile 2	**2100**	ND	**1900**
SB-10	*SB-10-(8-10)*	8-10 feet	11/11/2015	East of Soil Pile 2	**110**	ND	90
SB-11	*SB-11-(1-3)*	1-3 feet	11/11/2015	South-southeast of Soil Pile 2	**98**	ND	170
SB-11	*SB-11-(8-10)*	8-10 feet	11/11/2015	South-southeast of Soil Pile 2	**160**	ND	110
SB-12	*SB-12-(1-3)*	1-3 feet	11/11/2015	South of Soil Pile 2	**1500**	ND	**620**
SB-12	*SB-12-(8-10)*	8-10 feet	11/11/2015	South of Soil Pile 2	**92**	ND	60
SB-13	*SB-13-(1-3)*	1-3 feet	11/11/2015	North of Soil Pile 3	**28**	ND	65
SB-13	*SB-13-(13-15)*	8-10 feet	11/11/2015	North of Soil Pile 3	**280**	ND	**320**
SB-14	*SB-14-(1-3)*	1-3 feet	11/12/2015	Northeast of Soil Pile 3	**210**	ND	**320**
SB-14	*SB-14-(13-15)*	13-15 feet	11/12/2015	Northeast of Soil Pile 3	**44**	ND	50
SB-15	*SB-15-(1-3)*	1-3 feet	11/12/2015	Southwest of Soil Pile 3	**1300**	ND	**1100**
SB-15	*SB-15-(12-14)*	12-14 feet	11/12/2015	Southwest of Soil Pile 3	**57**	ND	54
SB-16	*SB-16-(1-3)*	1-3 feet	11/12/2015	Center of Soil Pile 3	**71**	ND	55

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	TPH (mg/kg) by EPA Method 8015D		
					Diesel Range Organics [C10 - C28]	Gasoline Range Organics [C6 - C10]	Oil Range Organics (C28-C40)
SB-16	*SB-16-(7-9)*	7-9 feet	11/12/2015	Center of Soil Pile 3	**85**	ND	72
SB-17	*SB-17-(1-3)*	1-3 feet	11/11/2015	Southeastern portion of Soil Pile 3	**600**	0.063 J	**550**
SB-17	*SB-17-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	**120**	ND	190
SB-17	*SB-17D-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	**76**	ND	190
SB-18	*SB-18-(1-3)*	1-3 feet	11/11/2015	Eastern portion of Soil Pile 3	**83**	0.072 J	100
SB-18	*SB-18-(13-15)*	13-15 feet	11/11/2015	Eastern portion of Soil Pile 3	**190**	ND	130
EPA Residential Soil RSL*					**11**	**8**	**250**
EPA Industrial Soil RSL*					**60**	**42**	**3300**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*					**1870**	**3690**	**1870**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*					**NS**	**32800**	**NS**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*					**NS**	**45000**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Child*					**15500**	**45000**	**15500**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Adult*					**NS**	**45000**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Commercial Worker*					**NS**	**63000**	**NS**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9, and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker, dated June 2011 and the EPA Region 3 RSLs for Industrial Soil and Residential Soil (target hazard quotient of 0.1), dated November 2015.

Bold results indicate the sample was above regulatory limits

DOEE - Washington DC Department of Energy & Environment

EPA - United States Environmental Protection Agency

J - - Estimated Concentration, bias low

J + - Estimated Concentration, bias high

J - Estimated Concentration

mg/kg - milligrams per kilogram

ND - Not Detected at or above the Laboratory Detection Limit

NS - No Standard

RBSL - Risk-Based Screening Level

RSL - Regional Screening Level

TPH - Total Petroleum Hydrocarbons

TABLE 4: SOIL SAMPLE ANALYTICAL RESULTS
METALS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	Metals (mg/kg) by EPA Method 6010C and 7471B																				
					Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
SB-1	*SB-1-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	6800	ND	**3**	85	0.42	ND	810	10	**11**	9.1	**14000 J**	12	800	**360**	0.021	9.2	830	ND	ND	61	21	24
SB-1	*SB-1D-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	7100	ND	**5.3**	83	0.74	ND	2000	13	**16**	12	**26000**	14	1100	**1200**	0.021	13	720	0.35	ND	65	24	37
SB-1	*SB-1-(12-14)*	12-14 feet	11/10/2015	Northwest of Soil Pile 1	7500	ND	**5.9**	90	0.6	0.2 J	6400	17	**9**	23	**21000**	110	1000	**300**	0.75	9.6	790	0.76	ND	160	36	110
SB-2	*SB-2-(1-3)*	1-3 feet	11/10/2015	West of Soil Pile 1	4700	ND	**1.9**	29	0.32 J	0.31 J	790	9.5 B	**5.1 J**	9	**10000**	6.4	890	97	0.14	7.8	520 J,B	ND	ND	88 J	17	22
SB-2	*SB-2-(8-10)*	8-10 feet	11/10/2015	West of Soil Pile 1	5600	ND	**4.6**	110	0.77	0.34 J	14000	18	**9.6**	23	**24000**	120	2300	**310**	ND	24	970	0.51 J	ND	400 J	**40**	120
SB-3	*SB-3-(1-3)*	1-3 feet	11/10/2015	Southwest of Soil Pile 1	6200	ND	**6.9**	48	0.65	ND	9000	12	**7.4**	12	**15000**	16	1800	**380**	ND	11	1100	ND	ND	76 J	18	39
SB-3	*SB-3-(11-13)*	11-13 feet	11/10/2015	Southwest of Soil Pile 1	6700 J	ND	**1.8**	62	0.42 J	ND	990	11	**6.6**	8.6	**16000**	11	1600	69 F1	0.031 J	12	860	0.4 J	ND	69 J	14	39
SB-4	*SB-4-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	7300	ND	**7.1**	110	0.59	0.13 J	2500	15	**10**	22	**18000**	260	1300	**310**	0.23	13	840	0.39 J	ND	67 J	23	120
SB-4	*SB-4-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	6900	0.34 J	**3**	73	0.71	0.13 J	700	11	**17**	7.3	**9000**	8.3	890	71	0.66	17	580 J	0.51 J	ND	56 J	16	37
SB-5	*SB-5-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	4300	ND	**2.4**	49	0.24 J	0.46 J	47000	37	**9.6**	31	**12000**	79	36000	**200**	ND	140	390 J	0.72 J	0.64	140 J	34	120
SB-5	*SB-5-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	**9800**	ND	**3.5**	100	0.96	0.091 J	1300	18	**13**	16	**15000**	50	1200	**320**	0.17	15	770	0.4 J	ND	47 J	25	55
SB-6	*SB-6-(1-3)*	1-3 feet	11/10/2015	East of Soil Pile 1	5300	ND	**3.6**	37	0.43	0.078 J	5900	20	**13**	9.6	**16000**	40	3600	160	0.023 J	38	660	ND	ND	55 J	23	38
SB-6	*SB-6-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	6500	ND	**2.6**	54	0.94	0.12 J	740	13	**9.2**	10	**11000**	9.4	1100	**190**	0.046	14	660	0.6 J	ND	39 J	17	43
SB-6	*SB-6D-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	7000	ND	**2.7**	76	0.89	0.098 J	950	15	**8.8**	11	**17000**	11	1300	**780**	0.059	14	850	ND	ND	47 J	20	47
SB-7	*SB-7-(1-3)*	1-3 feet	11/11/2015	Southwest of Soil Pile 2	4100	0.57 J	**2.7**	42	0.35 J	0.3 J	3200	12 B	**4.3 J**	21	**12000**	37	1200	180	0.091	13	520 J	ND	0.37 J	110 J	13	76
SB-7	*SB-7-(8-10)*	8-10 feet	11/11/2015	Southwest of Soil Pile 2	3800	ND	**2.4**	24	0.36 J	ND	470 J	8.5 B	**4.1 J**	7.9	**12000**	4.4	880	130	ND	7.1	500 J	ND	ND	29 J	11	19
SB-8	*SB-8-(1-3)*	1-3 feet	11/11/2015	Northwest of Soil Pile 2	6800	0.34 J	**3**	66	0.65	0.12 J	1200	16 B	**9.9**	15	**14000**	12	2000	110	0.028 J	18	870	ND	ND	79 J	18	47
SB-8	*SB-8-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	**8300**	ND	**2.3**	120	0.32 J	0.045 J	27000	14 B	**6.1**	19	**12000**	29	4200	**190**	0.014 J	11	1800	ND	ND	190 J	24	33
SB-8	*SB-8D-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	**8300**	ND	**2.7**	93 B	0.32 J	0.044 J	24000	14 B	**6**	13	**11000**	25	3700	170	0.044	11	1900	0.45 J	ND	180 J	22	32
SB-9	*SB-9(1-3)*	1-3 feet	11/11/2015	North-northeast of Soil Pile 2	6400 J	ND UJ-	**6.3**	64 J+	0.5	0.078 J	14000 J-	16 J+	**7.1**	17 J+	**22000 J**	45 J+	2900 J-	**790 B**	0.071	23	710	0.52 J	ND	150 J	24	50 J+
SB-9	*SB-9-(12-14)*	12-14 feet	11/11/2015	North-northeast of Soil Pile 2	**8300**	1.2	**7.9**	53 B	1.2	ND	8800	22	**18**	49	**34000 B**	76	1700	**480 B**	**2.1**	130	1500	0.62 J	ND	74 J	**40**	53
SB-10	*SB-10- (1-3)*	1-3 feet	11/11/2015	East of Soil Pile 2	**11000**	ND	**5.3**	38 B	0.61	ND	2100	14 B	**12**	13	**22000 B**	21	1700	110 B	0.1	15	1500	0.51 J	ND	50 J	24	52 B
SB-10	*SB-10-(8-10)*	8-10 feet	11/11/2015	East of Soil Pile 2	**12000**	ND	**3.7**	98 B	0.95	ND	7400	20 B	**9.9**	14	**15000 B**	22	1800	130 B	0.057	15	970	ND	ND	75 J	32	36 B
SB-11	*SB-11-(1-3)*	1-3 feet	11/11/2015	South-southeast of Soil Pile 2	5000	ND	**4.2**	61 B	0.37 J	0.03 J	3800	48 B	**13**	13	**15000 B**	100	7900	120 B	0.12	170	570	0.51 J	ND	54 J	24	60 B

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	Metals (mg/kg) by EPA Method 6010C and 7471B																					
					Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
SB-11	*SB-11-(8-10)*	8-10 feet	11/11/2015	South-southeast of Soil Pile 2	3600	ND	**8.1**	**3500 B**	0.48	1.5	23000	24 B	**5.3 J**	210	**10000 B**	**400**	2500	100 B	**1.3**	13	390 J	0.57 J	ND	180 J	14	**2400B**
SB-12	*SB-12-(1-3)*	1-3 feet	11/11/2015	South of Soil Pile 2	7600	ND	**5.5**	94 B	0.78	0.13 J	14000	21 B	**14**	22	**19000 B**	85	8400	**270 B**	ND	63	720	0.67 J	ND	140 J	25	130 B
SB-12	*SB-12-(8-10)*	8-10 feet	11/11/2015	South of Soil Pile 2	**14000**	0.43 J	**8.9**	46 B	0.5	ND	1000	19 B	**6.3**	16	**27000 B**	19	770	77 B	0.046	9.3	1000	0.42 J	ND	69 J	35	33 B
SB-13	*SB-13-(1-3)*	1-3 feet	11/11/2015	North of Soil Pile 3	**8300**	0.61 J	**5.3**	67 B	0.59	0.42 J	2600	23 B	**8.5**	30	**16000 B**	82	2900	**230 B**	0.11	22	1400	ND	0.54	87 J	28	130 B
SB-13	*SB-13-(13-15)*	8-10 feet	11/11/2015	North of Soil Pile 3	6200	0.79 J	**7.1**	150 B	0.96	0.68	3100	26 B	**9.9**	51	**43000 B**	370	1000	130 B	0.29	23	600	0.95 J	ND	260 J	**72**	270 B
SB-14	*SB-14-(1-3)*	1-3 feet	11/12/2015	Northeast of Soil Pile 3	**9200**	0.93 J	**4.5**	63	0.48	0.19 J	5900	49	**11**	72	**25000**	100	4000	**200**	0.065	35	1200	ND	3.4	87 J	36	81
SB-14	*SB-14-(13-15)*	13-15 feet	11/12/2015	Northeast of Soil Pile 3	7600	0.42 J	**4**	33	0.7	ND	24000	18	**16**	49	**27000**	68	2100	**240**	0.062	31	1400	0.58 J	ND	100 J	35	110
SB-15	*SB-15-(1-3)*	1-3 feet	11/12/2015	Southwest of Soil Pile 3	4300	0.58 J-	**2.3**	59	0.86	0.28 J	6000 J-	12	**12**	26 J-	**22000**	51 J-	1400	**470**	0.031 J	16	690	ND	0.41 J-	270 J	27	140 J-
SB-15	*SB-15-(12-14)*	12-14 feet	11/12/2015	Southwest of Soil Pile 3	3700	0.65 J	**1.4**	140	0.82	0.46 J	3000	19	**7.9**	28	**12000**	110	1200	**330**	0.25	11	760	ND	0.5 J	720	11	120
SB-16	*SB-16-(1-3)*	1-3 feet	11/12/2015	Center of Soil Pile 3	4000	0.43 J	**1.1 J**	66	0.92	0.27 J	18000	11	**13**	24	**27000**	79	1600	**610**	0.043	16	930	0.47 J	0.47 J	300 J	21	94
SB-16	*SB-16-(7-9)*	7-9 feet	11/12/2015	Center of Soil Pile 3	5900	0.79 J	**3.1**	59	0.8	0.33 J	2400	23	**13**	22	**20000**	41	1700	**280**	0.084	20	840	ND	0.27 J	480 J	26	150
SB-17	*SB-17-(1-3)*	1-3 feet	11/11/2015	Southeastern portion of Soil Pile 3	**9900**	**3.9**	**5.4**	95 B	0.56	1.2	20000	29 B	**10**	48	**25000 B**	**710**	4100	**300 B**	0.34	51	860	0.68 J	2	370 J	26	220 B
SB-17	*SB-17-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	6700	ND	**1.5**	80 B	0.5	ND	720	9.7 B	**9**	9.5	**10000 B**	16	1000	35 B	0.019 J	13	890	ND	ND	130 J	13	39 B
SB-17	*SB-17D-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	7400	ND	**5.9**	88 B	0.64	0.061 J	12000	20 B	**8.1**	23	**22000 B**	76	1400	120 B	0.062	12	1100	0.94 J	ND	420 J	**40**	67 B
SB-18	*SB-18-(1-3)*	1-3 feet	11/11/2015	Eastern portion of Soil Pile 3	6000	0.8 J	**3.1**	43 B	0.71	0.61	2600	16 B	**14**	32	**19000 B**	65	1700	**220 B**	0.13	23	1000	ND	1.5	410 J	22	130 B
SB-18	*SB-18-(13-15)*	13-15 feet	11/11/2015	Eastern portion of Soil Pile 3	7500	ND	**5.9**	55 B	0.47	ND	5100	14 B	**5.1 J**	29	**17000 B**	64	1100	**250 B**	0.16	6.3	660	0.72 J	ND	160 J	29	57 B
EPA Residential Soil RSL*					**7700**	**3.1**	**0.68**	**1500**	**16**	**7.1**	**NS**	**NS**	**2.3**	**310**	**5500**	**400**	**NS**	**180**	**1.2**	**NS**	**NS**	**39**	**39**	**NS**	**39**	**2300**
EPA Industrial Soil RSL*					**110000**	**47**	**3**	**22000**	**230**	**98**	**NS**	**NS**	**35**	**4700**	**82000**	**800**	**NS**	**2600**	**4.6**	**NS**	**NS**	**580**	**580**	**NS**	**580**	**35000**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the EPA Region 3 RSLs for Industrial Soil and Residential Soil (target hazard quotient of 0.1), dated November 2015. No regulatory values for metals are available from the DOEE.

Bold results indicate the sample was above regulatory limits
DOEE - Washington DC Department of Energy & Environment
EPA - United States Environmental Protection Agency
J - Estimated Concentration
J - - Estimated Concentration, bias low
J + - Estimated Concentration, bias high
mg/kg - Milligrams per kilogram
ND - Not Detected at or above the Laboratory Detection Limit
NS - No Standard
RBSL - Risk-Based Screening Level
RSL - Regional Screening Level
UJ- Esimated Non-detected Concentration

TABLE 5: SOIL SAMPLE ANALYTICAL RESULTS
POLYCHLORINATED BIPHENYLS
KINGMAN ISLAND
WASHINGTON, DC 20003

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	PCBs (mg/kg) by EPA Method 8082A	
					PCB-1242	PCB-1260
SB-1	*SB-1-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND
SB-1	*SB-1D-(1-3)*	1-3 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND
SB-1	*SB-1-(12-14)*	12-14 feet	11/10/2015	Northwest of Soil Pile 1	ND	ND
SB-2	*SB-2-(1-3)*	1-3 feet	11/10/2015	West of Soil Pile 1	ND	ND
SB-2	*SB-2-(8-10)*	8-10 feet	11/10/2015	West of Soil Pile 1	ND	0.027
SB-3	*SB-3-(1-3)*	1-3 feet	11/10/2015	Southwest of Soil Pile 1	ND	ND
SB-3	*SB-3-(11-13)*	11-13 feet	11/10/2015	Southwest of Soil Pile 1	ND	ND
SB-4	*SB-4-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-4	*SB-4-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-5	*SB-5-(1-3)*	1-3 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-5	*SB-5-(10-12)*	10-12 feet	11/10/2015	Southeast of Soil Pile 1	ND	ND
SB-6	*SB-6-(1-3)*	1-3 feet	11/10/2015	East of Soil Pile 1	ND	ND
SB-6	*SB-6-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	ND	ND
SB-6	*SB-6D-(10-12)*	10-12 feet	11/10/2015	East of Soil Pile 1	ND	ND
SB-7	*SB-7-(1-3)*	1-3 feet	11/11/2015	Southwest of Soil Pile 2	ND	0.010 J
SB-7	*SB-7-(8-10)*	8-10 feet	11/11/2015	Southwest of Soil Pile 2	ND	ND
SB-8	*SB-8-(1-3)*	1-3 feet	11/11/2015	Northwest of Soil Pile 2	ND	ND
SB-8	*SB-8-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	ND	0.051
SB-8	*SB-8D-(11-13)*	11-13 feet	11/11/2015	Northwest of Soil Pile 2	ND	0.015 J
SB-9	*SB-9(1-3)*	1-3 feet	11/11/2015	North-northeast of Soil Pile 2	ND	0.083 J
SB-9	*SB-9-(12-14)*	12-14 feet	11/11/2015	North-northeast of Soil Pile 2	ND	ND
SB-10	*SB-10- (1-3)*	1-3 feet	11/11/2015	East of Soil Pile 2	ND	ND
SB-10	*SB-10-(8-10)*	8-10 feet	11/11/2015	East of Soil Pile 2	ND	ND
SB-11	*SB-11-(1-3)*	1-3 feet	11/11/2015	South-southeast of Soil Pile 2	ND	0.039
SB-11	*SB-11-(8-10)*	8-10 feet	11/11/2015	South-southeast of Soil Pile 2	ND	0.083 J
SB-12	*SB-12-(1-3)*	1-3 feet	11/11/2015	South of Soil Pile 2	ND	ND
SB-12	*SB-12-(8-10)*	8-10 feet	11/11/2015	South of Soil Pile 2	ND	ND
SB-13	*SB-13-(1-3)*	1-3 feet	11/11/2015	North of Soil Pile 3	ND	0.039
SB-13	*SB-13-(13-15)*	8-10 feet	11/11/2015	North of Soil Pile 3	ND	0.067
SB-14	*SB-14-(1-3)*	1-3 feet	11/12/2015	Northeast of Soil Pile 3	ND	ND
SB-14	*SB-14-(13-15)*	13-15 feet	11/12/2015	Northeast of Soil Pile 3	ND	ND

Boring ID	Sample ID	Sample Depth	Date Collected	Boring Location	PCBs (mg/kg) by EPA Method 8082A	
					PCB-1242	PCB-1260
SB-15	*SB-15-(1-3)*	1-3 feet	11/12/2015	Southwest of Soil Pile 3	0.094	0.076
SB-15	*SB-15-(12-14)*	12-14 feet	11/12/2015	Southwest of Soil Pile 3	ND	ND
SB-16	*SB-16-(1-3)*	1-3 feet	11/12/2015	Center of Soil Pile 3	ND	ND
SB-16	*SB-16-(7-9)*	7-9 feet	11/12/2015	Center of Soil Pile 3	ND	ND
SB-17	*SB-17-(1-3)*	1-3 feet	11/11/2015	Southeastern portion of Soil Pile 3	ND	0.061
SB-17	*SB-17-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	ND	ND
SB-17	*SB-17D-(17-19)*	17-19 feet	11/11/2015	Southeastern portion of Soil Pile 3	ND	ND
SB-18	*SB-18-(1-3)*	1-3 feet	11/11/2015	Eastern portion of Soil Pile 3	ND	0.095 J
SB-18	*SB-18-(13-15)*	13-15 feet	11/11/2015	Eastern portion of Soil Pile 3	ND	ND
EPA Residential Soil RSL*					**0.23**	**0.24**
EPA Industrial Soil RSL*					**0.95**	**0.99**

Only detected analytes are presented

Notes:
* Regulatory values obtained from the EPA Region 3 RSLs for Industrial Soil and Residential Soil (target hazard quotient of 0.1), dated November 2015.
No regulatory values for PCBs are available from the DOEE.
Bold results indicate the sample was above regulatory limits
DOEE - Washington DC Department of Energy & Environment
EPA - United States Environmental Protection Agency
J - Estimated Concentration
J - - Estimated Concentration, bias low
J + - Estimated Concentration, bias high
mg/kg - Milligrams per kilogram
ND - Not Detected at or above the Laboratory Detection Limit
NS - No Standard
PCBs - Polychlorinated Biphenyls
RBSL - Risk-Based Screening Level
RSL - Regional Screening Level

TABLE 6: GROUNDWATER SAMPLE ANALYTICAL RESULTS
VOLATILE ORGANIC COMPOUNDS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Date Collected	Boring Location	VOCs (µg/L) by EPA Method 8260C							
				2-Butanone (MEK)	2-Hexanone	Acetone	Benzene	Carbon disulfide	cis-1,2-Dichloroethene	Toluene	Vinyl chloride
SB-2	*SB-2-W*	11/10/2015	West of Soil Pile 1	17	1.2 J	36	ND	ND	ND	ND	ND
SB-4	*SB-4-W*	11/10/2015	Southeast of Soil Pile 1	4 J	0.25 J	9.2	ND	0.23 J	ND	ND	ND
SB-4	*SB-4D-W*	11/10/2015	Southeast of Soil Pile 1	6.8	0.74 J	7.8	ND	ND	ND	ND	ND
SB-6	*SB-6-W*	11/10/2015	East of Soil Pile 1	11	1.7 J	8.4	ND	0.83 J	ND	ND	ND
SB-7	*SB-7-W*	11/11/2015	Southwest of Soil Pile 2	2.8 J	0.43 J	7.5	ND	ND	ND	0.16 J	ND
SB-9	*SB-9-W*	11/11/2015	Northeast of Soil Pile 2	1.3 J	ND	4.7 J	ND	ND	ND	ND	ND
SB-11	*SB-11-W*	11/11/2015	South-southeast of Soil Pile 2	1.8 J	ND	5.8	ND	0.25 J	1.4	0.16 J	2.3
SB-13	*SB-13-W*	11/11/2015	Northeast of Soil Pile 3	ND	ND	4.8 J	ND	0.43 J	ND	ND	ND
SB-15	*SB-15-W*	11/12/2015	West of Soil Pile 3	13	ND	61	0.18 J	ND	ND	ND	ND
SB-17	*SB-17-W*	11/11/2015	East of Soil Pile 3	ND	ND	7.3	ND	ND	ND	ND	ND
EPA Biological Technical Assistance Group (BTAG) Freshwater Screening Values*				**14000**	**99**	**1500**	**370**	**0.92**	**NS**	**2**	**930**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*				**NS**	**NS**	**NS**	**5**	**NS**	**NS**	**1000**	**NS**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*				**NS**	**NS**	**NS**	**5**	**NS**	**NS**	**1000**	**NS**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*				**NS**	**NS**	**NS**	**68**	**NS**	**NS**	**47500**	**NS**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9 and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker; dated June 2011; and the EPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Screening Values, dated July 2006. In instances where mutipile DOEE RBSLs exist for a given compound determined by exposure pathway, the most stringent RBSL was used.

Bold results indicate the sample was above regulatory limits

DOEE - Washington DC Department of Energy & Environment

EPA - United States Environmental Protection Agency

J - Estimated Concentration

MCL - Maximum Contaminant Levels

ND - Not detected at or above the Laboratory Detection Limit

NS - No Standard

RBSL - Risk-Based Screening Level

µg/L - Micrograms per liter

VOCs - Volatile Organic Compounds

TABLE 7: GROUNDWATER SAMPLE ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Date Collected	Boring Location	PAH (µg/L) by EPA Method 8270D LL															
				Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a,h)anthracen	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene
SB-2	*SB-2-W*	11/10/2015	West of Soil Pile 1	**15**	1.4	**22**	**25**	**20**	**22**	11	**8.7**	**23**	3.9	**49**	**11**	11	**3.3**	**37**	**32**
SB-4	*SB-4-W*	11/10/2015	Southeast of Soil Pile 1	0.13 J	ND	**0.16 J**	**0.45**	**0.48**	**0.42**	0.43	**0.19**	0.57	0.11 J	**0.87**	0.1 J	0.31	0.16 J	**0.46 UJ**	**0.59**
SB-4	*SB-4D-W*	11/10/2015	Southeast of Soil Pile 1	0.11 J	ND	**0.14 J**	**0.33**	**0.35**	**0.43**	0.29	**0.11 J**	0.4	0.11 J	**0.66**	0.1 J	0.28	0.17 J	**0.42**	**0.49**
SB-6	*SB-6-W*	11/10/2015	East of Soil Pile 1	2.4	2.2	**4.2**	**5.2**	**5.4**	**9.2**	5	**3.1**	**8.8**	1.2	**30**	2.5	4.4	**2.4**	**29**	**15**
SB-7	*SB-7-W*	11/11/2015	Southwest of Soil Pile 2	0.17 J	ND	**0.19**	**0.27**	**0.24**	**0.23**	0.18 J	**0.16 J**	0.29	ND	**0.76**	0.13 J	0.18 J	0.19	**0.63**	**0.51**
SB-9	*SB-9-W*	11/11/2015	Northeast of Soil Pile 2	0.38	0.23	**0.48**	**0.85**	**0.78**	**1.1**	0.61	**0.4**	**1**	0.2	**2.2**	0.39	0.55	**1.2**	**1.3**	**1.4**
SB-11	*SB-11-W*	11/11/2015	South-southeast of Soil Pile 2	**9.7**	2.4	**24**	**52**	**43**	**54**	30	**18**	**49**	9.1	**120**	**12**	29	**12**	**81**	**65**
SB-13	*SB-13-W*	11/11/2015	Northeast of Soil Pile 3	ND	ND	**1.1 J**	ND	ND	ND	ND	ND	ND	ND	**3.6 J**	ND	ND	ND	**1.7 J**	**2.9 J**
SB-15	*SB-15-W*	11/12/2015	West of Soil Pile 3	0.58 J	0.42 J	**0.83**	**2.5**	**2.3**	**2.5**	1.5	**1.4**	**2.5**	0.43 J	**4.4**	0.75 J	1.3	**1.5**	**3.2**	**4.2**
SB-17	*SB-17-W*	11/11/2015	East of Soil Pile 3	1.5 J	1.1 J	**2.6 J**	**8.1**	**7.1**	**8.8**	5.5	**2.7 J**	**8.2**	ND	**18**	1.4 J	5.9	**2.9**	**8.8**	**12**
EPA Biological Technical Assistance Group (BTAG) Freshwater Screening Values*				**5.8**	**NS**	**0.012**	**0.018**	**0.015**	**NS**	**NS**	**NS**	**NS**	**NS**	**0.04**	**3**	**NS**	**1.1**	**0.4**	**0.025**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*				**NS**	**NS**	**NS**	**0.143**	**0.00281**	**0.0276**	**40.8**	**0.293**	**2.93**	**NS**	**300**	**626**	**NS**	**1.07**	**409**	**255**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*				**NS**	**NS**	**NS**	**0.0274**	**0.00161**	**0.0158**	**93.6**	**0.0785**	**0.785**	**NS**	**687**	**1460**	**NS**	**0.268**	**938**	**585**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*				**NS**	**NS**	**NS**	**0.0636**	**0.00374**	**0.0368**	**226**	**0.526**	**6**	**NS**	**1,660**	**5,830**	**NS**	**5,690**	**2,270**	**1,420**

Only detected analytes are presented

Notes:
* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9 and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker; dated June 2011; and the EPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Screening Values, dated July 2006. In instances where mutipile DOEE RBSLs exist for a given compound determined by
Bold results indicate the sample was above regulatory limits

DOEE - Washington DC Department of Energy & Environment

EPA - United States Environmental Protection Agency

J - Estimated Concentration

LL - Low Level

ND - Not Detected at or above the Laboratory Detection Limit

MCL - Maximum Contaminant Levels

NS - No Standard

PAHs - Polycyclic Aromatic Hydrocarbons

RBSL - Risk-Based Screening Level

µg/L - micrograms per liter

UJ - Esimated Non-detected concentration

TABLE 8: GROUNDWATER SAMPLE ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Date Collected	Boring Location	TPH (µg/L) by EPA Method 8015D		
				Diesel Range Organics [C10 - C28]	Gasoline Range Organics [C6 - C10]	Oil Range Organics (C28-C40)
SB-2	*SB-2-W*	11/10/2015	West of Soil Pile 1	**2600**	40 UJ	**550**
SB-4	*SB-4-W*	11/10/2015	Southeast of Soil Pile 1	**860**	44 UJ	ND
SB-4	*SB-4D-W*	11/10/2015	Southeast of Soil Pile 1	**960**	2.8 UJ	ND
SB-6	*SB-6-W*	11/10/2015	East of Soil Pile 1	**2500**	42 UJ	460 J
SB-7	*SB-7-W*	11/11/2015	Southwest of Soil Pile 2	**2000**	47 UJ	**750**
SB-9	*SB-9-W*	11/11/2015	Northeast of Soil Pile 2	**1100**	62 UJ	280 J
SB-11	*SB-11-W*	11/11/2015	South-southeast of Soil Pile 2	**2000**	41 UJ	460 J
SB-13	*SB-13-W*	11/11/2015	Northeast of Soil Pile 3	**1300**	43 UJ	ND
SB-15	*SB-15-W*	11/12/2015	West of Soil Pile 3	**8900**	54 J	**2300**
SB-17	*SB-17-W*	11/11/2015	East of Soil Pile 3	**3000**	38 UJ	**700**
EPA Biological Technical Assistance Group (BTAG) Freshwater Screening Values*				**NS**	**NS**	**NS**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*				**313**	**313**	**469**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*				**438**	**438**	**1,100**
DOEE Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*				**369000**	**1330000**	**NS**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9 and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker; dated June 2011; and the EPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Screening Values, dated July 2006. In instances where mutipile DOEE RBSLs exist for a given compound determined by exposure pathway, the most stringent RBSL was used.

Bold results indicate the sample was above regulatory limits
DOEE - Washington DC Department of Energy & Environment
EPA - United States Environmental Protection Agency
J - Estimated Concentration
MCL - Maximum Contaminant Levels
ND - Not Detected at or above the Laboratory Detection Limit
NS - No Standard
RBSL - Risk-Based Screening Level
TPH - Total Petroleum Hydrocarbons
µg/L - micrograms per liter
UJ- Esimated Non-detected concentration

TABLE 9: GROUNDWATER SAMPLE ANALYTICAL RESULTS
METALS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Date Collected	Boring Location	Metals (µg/L) by EPA Method 6020A and 7470A																					
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
SB-2	*SB-2-W*	11/10/2015	West of Soil Pile 1	**1500000 J**	**38**	**1000 J**	**20000 J**	**210**	**110**	**820000**	**3900**	**2500 J**	**6300**	**3400000**	**27000**	**330000**	**59000**	**56**	3200	**150000 J**	**130 J**	**39 J**	73000	**24**	**5000**	**50000 J**
SB-4	*SB-4-W*	11/10/2015	Southeast of Soil Pile 1	**1900000**	9.5 J	**700**	**24000**	**320**	**40 J**	**280000**	**4500**	**3100**	**3500**	**3800000**	**4700**	**320000**	**72000**	**9.7**	3900	**200000**	**140**	**15 J**	15000	**39**	**5600**	**12000 J**
SB-4	*SB-4D-W*	11/10/2015	Southeast of Soil Pile 1	**1800000**	8.7 J	**670**	**21000**	**300**	**37**	**270000**	**4300**	**3000**	**3500**	**3800000**	**4400**	**300000**	**71000**	**12 J**	3800	**180000 J**	**130 J**	**14 J**	14000	**32**	**5400**	**11000**
SB-6	*SB-6-W*	11/10/2015	East of Soil Pile 1	**1800000**	14 J	**1000**	**14000**	**180**	**27**	**420000 J**	**3700**	**2400**	**3600**	**4000000 J**	**7900**	**240000**	**39000**	**10 J**	3200	**130000 J**	**100**	**11 J**	26000	**24**	**4800**	**10000 J**
SB-7	*SB-7-W*	11/11/2015	Southwest of Soil Pile 2	**1500000**	15 J	**1400**	**18000**	**240**	**40**	**360000**	**4400**	**2100**	**4100**	**5000000**	**2600**	**320000 B**	**35000**	**2**	4000	**150000 B**	**59**	**4.5 J**	31000 B	**17**	**4900**	**12000**
SB-9	*SB-9-W*	11/11/2015	Northeast of Soil Pile 2	**710000**	**120**	**840**	**12000**	**91**	**47**	**820000**	**2200**	**1100**	**4800**	**3300000**	**50000**	**170000 B**	**30000**	**12**	2200	**70000 B**	**54**	**23**	27000 B	**14**	**2400**	**19000**
SB-11	*SB-11-W*	11/11/2015	South-southeast of Soil Pile 2	**1100000**	8 J	**550**	**16000**	**200**	**37**	**510000**	**2800**	**2200**	**3100**	**2500000**	**65000**	**250000 B**	**44000**	**6.9**	2500	**110000 B**	**79**	**13**	35000 B	**19**	**3400**	**13000**
SB-13	*SB-13-W*	11/11/2015	Northeast of Soil Pile 3	**570000**	6.6 J	**260**	**5900**	**82**	**21**	**130000**	**1900**	**1200**	**1200**	**1900000**	**1800**	**130000 B**	**32000**	**1.3**	1500	**95000**	**40**	**3.9 J**	11000 B	**11**	**2200**	**4600**
SB-15	*SB-15-W*	11/12/2015	West of Soil Pile 3	**83000 B**	1.1 J	**26**	**830**	**7.7**	**1.3**	49000	**170**	**96**	**120**	**130000**	**220**	30000	**2200**	**3.8**	130	15000 B	**5.7**	0.81 J	80000 B	**1.2**	**210**	**430**
SB-17	*SB-17-W*	11/11/2015	East of Soil Pile 3	**540000**	**490**	**590**	**13000**	**65**	**630**	**2700000**	**1500**	**680**	**3000**	**1700000**	**42000**	**180000 B**	**20000**	**8.6**	990	**77000 B**	**82**	**17**	110000 B	**10**	**1900**	**31000**
EPA Biological Technical Assistance Group (BTAG) Freshwater Screening Values*				**87**	**30**	**5**	**4**	**0.66**	**0.25**	**116000**	**85**	**23**	**9**	**300**	**3**	**82000**	**120**	**0.026**	**52**	**53000**	**1**	**3.2**	**680000**	**0.8**	**20**	**120**

Only detected analytes are presented

Notes:
* Regulatory values obtained from the EPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Screening Values, dated July 2006. No regulatory values for metals are available from the DOEE.
Bold results indicate the sample was above regulatory limits
DOEE - Washington DC Department of Energy & Environment
EPA - United States Environmental Protection Agency
J - Estimated Concentration
MCLs - Maximum Contaminant Levels
NS - No Standard
RBSL - Risk-Based Screening Level
µg/L - micrograms per liter

TABLE 10: GROUNDWATER SAMPLE ANALYTICAL RESULTS
POLYCHLORINATED BIPHENYLS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Sample ID	Date Collected	Boring Location	PCBs (µg/L) by EPA Method 8082A
				PCB-1260
SB-2	*SB-2-W*	11/10/2015	West of Soil Pile 1	ND
SB-4	*SB-4-W*	11/10/2015	Southeast of Soil Pile 1	ND
SB-4	*SB-4D-W*	11/10/2015	Southeast of Soil Pile 1	ND
SB-6	*SB-6-W*	11/10/2015	East of Soil Pile 1	ND
SB-7	*SB-7-W*	11/11/2015	Southwest of Soil Pile 2	**2.5**
SB-9	*SB-9-W*	11/11/2015	Northeast of Soil Pile 2	ND
SB-11	*SB-11-W*	11/11/2015	South-southeast of Soil Pile 2	ND
SB-13	*SB-13-W*	11/11/2015	Northeast of Soil Pile 3	ND
SB-15	*SB-15-W*	11/12/2015	West of Soil Pile 3	**0.35 J+**
SB-17	*SB-17-W*	11/11/2015	East of Soil Pile 3	**0.47**
EPA Biological Technical Assistance Group (BTAG) Freshwater Screening Values*				**0.000074**

Only detected analytes are presented

Notes:
* Regulatory values obtained from the EPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Screening Values, dated July 2006. No regulatory values for PCBs are available from the DOEE.
Bold results indicate the sample was above regulatory limits
DOEE - Washington DC Department of Energy & Environment
EPA - United States Environmental Protection Agency
J + - Estimated Concentration with high bias
MCLs - Maximum Contaminant Levels
ND - Not Detected at or above the Laboratory Detection Limit
NS - No Standard
PCBs - Polychlorinated Biphenyls
RBSL - Risk-Based Screening Level
µg/L - micrograms per liter

TABLE 11: TEST PIT SAMPLE ANALYTICAL RESULTS
DETECTION SUMMARY
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Date Collected	Sample ID	TPH (mg/kg) by EPA Method 8015D			PCBs (mg/kg) by EPA Method 8082A	General Chemistry by EPA Method 9045D, 9014 and 9034				
			Diesel Range Organics [C10 - C28]	Gasoline Range Organics [C6 - C10]	Oil Range Organics (C28-C40)	PCB-1260	Ignitability	Ph (Standard Units)	Sulfide (mg/kg)	Percent Mositure (%)	Percent Solids (%)
Soil Pile 1	11/10/2015	*SOIL COMP 1*	**24**	0.060 J	59	ND	No	7.35	15 J	13	87
Soil Pile 2	11/11/2015	*SOIL COMP 2*	**97**	ND	120	0.027	No	7.73	ND	12	88
Soil Pile 3	11/12/2015	*SOIL COMP 3*	**29**	ND	52	**0.32**	No	7.73	28 J	22	78
EPA Residential Soil RSL*			**11**	**8**	**250**	**0.24**	**NS**	**NS**	**NS**	**NS**	**NS**
EPA Industrial Soil RSL*			**60**	**42**	**3300**	**0.99**	**NS**	**NS**	**NS**	**NS**	**NS**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Child*			**1870**	**3690**	**1870**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Resident Adult*			**NS**	**32800**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
DOEE Surficial Soil Ingestion, Inhalation, and Dermal Contact RBSLs for a Commercial Worker*			**NS**	**45000**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Child*			**15500**	**45000**	**15500**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Resident Adult*			**NS**	**45000**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
DOEE Subsurface Soil Outdoor Inhalation RBSLs for a Commercial Worker*			**NS**	**63000**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the DOEE Toxic Substances Division Underground Storage Tank Branch, District of Columbia Risk-Based Corrective Action Technical Guidance (Risk-Based Decision Making) Tables 5-8, 5-9, and 5-10, RBSLs for a Residential Child, Adult, and Commercial Worker, dated June 2011; and the EPA Region 3 RSLs for Industrial Soil and Residential Soil (target hazard quotient of 0.1), dated November 2015.

Bold results indicate the sample was above regulatory limits

DOEE - Washington DC Department of Energy & Environment

EPA - United States Environmental Protection Agency

J - Estimated Concentration

mg/kg - Milligrams per kilogram

ND - Not Detected at or above the Laboratory Detection Limit

NS - No Standard

PCBs - Polychlorinated Biphenyls

RBSL - Risk-Based Screening Level

RSL - Regional Screening Level

TPH - Total Petroleum Hydrocarbons

TABLE 12: TEST PIT SAMPLE ANALYTICAL RESULTS
DETECTION SUMMARY TCLP METALS
KINGMAN ISLAND
WASHINGTON, DC

Boring ID	Date Collected	Sample ID	TCLP Metals (mg/L) by EPA Method 6010C					
			Arsenic	Barium	Cadmium	Chromium	Lead	Selenium
Soil Pile 1	11/10/2015	*SOIL COMP 1*	0.041 J	0.72 J	0.0037 J	ND	0.11 J	ND
Soil Pile 2	11/11/2015	*SOIL COMP 2*	0.041 J	0.67 J	0.0034 J	0.015 J	0.096 J	0.025 J
Soil Pile 3	11/12/2015	*SOIL COMP 3*	ND	1.0 J	0.0099 J	ND	0.32 J	ND
EPA Maximum Concentration of Contaminants for the Toxicity Characteristic			**5**	**100**	**1**	**5**	**5**	**1**

Only detected analytes are presented

Notes:

* Regulatory values obtained from the Maximum Concentration of Contaminants for the Toxicity Characteristic as shown in 40 CFR 261.24, Table 1. No regulatory values for metals are available from the DOEE.

Bold results indicate the sample was above regulatory limits

DOEE - Washington, DC Department of Energy & Environment

J - Estimated Concentration

mg/L - Milligrams per kilogram

ND - Not Detected at or above the Laboratory Detection Limit

NS - No Standard

TCLP - Toxicity Characteristic Leaching Procedure

ATTACHMENT 5. LABORATORY ANALYTICAL RESULTS

ATTACHMENT 6. DATA VALIDATION REPORT

Tetra Tech EM Inc.
DATA VALIDATION REPORT

Site:	Kingman Island Site Investigation
Laboratory:	TestAmerica
Data Reviewer:	Sara Woolley, Tetra Tech
Review Date:	12/3 – 12/10/15, 1/14/16

Sample Delivery Group (SDG) Numbers	Sample Numbers
180-49695	Pile Comp 1
180-49752	Soil Comp-2
180-49798	Soil Comp 3 WST 1
180-49800	SB-15-(1-3) SB-15-(12-14) SB-15-W SB-16-(1-3) SB-16-(7-9) SB-14-(1-3) SB-14-(13-15) TB-111215
180-49685	SB-1-(12-14) SB-1-(1-3) SB-1D-(1-3) SB-2-(1-3) SB-2-(8-10) SB-2-W SB-3-(11-13) SB-3-(1-3) SB-4-(10-12) SB-4-(1-3) SB-4D-W SB-4-W SB-5-(10-12) SB-5-(1-3) SB-6-(10-12) SB-6-(1-3) SB-6D-(10-12) SB-6-W EB-111015 FB-111015 TB-111015
180-49745	SB-7-(1-3)

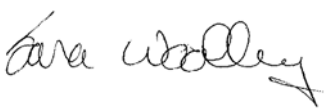
SB-7-(8-10)
SB-7-W
SB-8-(11-13)
SB-8-(1-3)
SB-8D-(11-13)
SB-9-(12-14)
SB-9-(1-3)
SB-9-W
SB-10-(1-3)
SB-10-(8-10)
SB-11-(1-3)
SB-11-(8-10)
SB-11-W
SB-12-(1-3)
SB-12-(8-10)
SB-13-(1-3)
SB-13-(13-15)
SB-13-W
SB-17-(1-3)
SB-17-(17-19)
SB-17D-(17-19)
SB-17-W
SB-18-(1-3)
SB-18-(13-15)
TB-111115

Matrix: Solid and Water

Collection Date(s): 11/10/15 – 11/12/15

The data were qualified according to the U.S. Environmental Protection Agency (EPA) documents "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Data Review" (June 2008), and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review" (October 2010).

I certify that all data validation criteria outlined in the above referenced documents were assessed, and any qualifications made to the data were in accordance with those documents.



Certified by
Sara Woolley, Senior Chemist

DATA VALIDATION REQUIREMENTS

Parameters

* Holding times
* Blanks
* Surrogate recovery
* Internal standards (where applicable)
* Matrix spike (MS)/matrix spike duplicate (where analyzed)
* Laboratory control sample (LCS) or blank spike
* LCS/LCS duplicate and MS/MSD relative percent difference
* Compound identification (where applicable)
* Field duplicates (not provided for this project)
* Overall assessment of data for the SDG

DATA VALIDATION QUALIFIERS AND CODES

Data Validation Qualifiers

UJ Estimated nondetected result

J Estimated detected result

J+ Estimated detected result/ High bias

J- Estimated detected result/ Low bias

R Rejected result

NJ Tentatively Identified Compound (TIC)

Data Validation Qualifier Codes

a Surrogate recovery exceedance

b Laboratory method blank and common blank contamination

c Calibration exceedance

d Duplicate precision exceedance

e Matrix spike/laboratory control sample (LCS) recovery exceedance

f Field blank contamination

g Quantification below reporting limit

h Holding time exceedance

i Internal standard exceedance

j Other qualifications

DATA VALIDATION SUMMARY

Analysis	Holding Times	Surrogates	LCS	Blanks	MS/MSD	RPD	Internal Standards	Other
GRO	√	√	√	Page 7	Page 7	Page 7	NA	Page 8
DRO	√	Page 9	√	√	Page 10	Page 10	N/A	Page 11
VOC	√	Page 12	Page 13	Page 13	Page 13	√	√	Page 14
SVOC	√	Page 15	√	Page 16	Page 16	Page 17	√	Page 17
Pesticide	√	√	√	√	N/A	√	√	Page 19
PCB	√	Page 20	Page 21	√	√	N/A	N/A	Page 22
Herbicides	√	√	√	√	N/A	√	N/A	√
Metals	√	N/A	Page 25	√	Page 26	Page 26	N/A	Page 27

Notes:
√ indicates that all quality control criteria were met for the parameter as specified in the prescribed methods and data validation guidelines.
N/A indicates the parameter is not applicable to an analysis.
If criteria were not met and the data were qualified, a page number is indicated where the qualification is detailed.
The data were evaluated for all validation criteria and were found to be in control except where noted. Any outliers are described in the text.

DATA ASSESSMENT

GASOLINE RANGE ORGANICS ANALYSIS (METHOD 8015)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

D. SDG # 180-49800 – all holding times were met.

E. SDG # 180-49685 – all holding times were met.

F. SDG # 180-49745 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – all surrogate recoveries were met.

D. SDG # 180-49800 – all surrogate recoveries were met.

E. SDG # 180-49685 – all surrogate recoveries were met.

F. SDG # 180-49745 – all surrogate recoveries were met.

III. Blank Spike or Laboratory Control Sample (LCS)

A. SDG #180-46965 - all LCS criteria were met.

B. SDG #180-49752 – all LCS criteria were met.

C. SDG # 180-49798 – all LCS criteria were met.

D. SDG # 180-49800 – all LCS criteria were met.

E. SDG # 180-49685 – all LCS criteria were met.

F. SDG # 180-49745 – all LCS criteria were met.

IV. Matrix Spike/Matrix Spike Duplicate

A. SDG # 180-49800 – all MS/MSD criteria were met.

B. SDG #180-49685 - due to low MS recovery, the following results are qualified as estimated (UJe/Je)

- Gasoline in sample SB-3-(11-13)

C. SDG # 180-49745 – all MS/MSD criteria were met.

V. Blank Contamination

A. SDG #180-46965 – all blanks were free of contamination.

B. SDG #180-49752 – all blanks were free of contamination.

C. SDG #180-49798 – all blanks were free of contamination.

D. SDG #180-49800 – all blanks were free of contamination.

E. SDG #188-49685 - Due to laboratory contamination in the water method blank, the following results are considered nondetected (UJb).

- Gasoline in samples SB-4-W, SB-6-W, FB-111015, EB-111015, SB-4D-W, SB-2-W

Compound	Blank ID	Concentration
Gasoline	240-207248/5	30.6 ug/L

F. SDG #188-49745 - Due to laboratory contamination in the water method blank, the following results are considered nondetected (UJb).

- Gasoline in samples SB-11-W, SB-17-W, SB-13-W, SB-7-W, SB-9-W

Compound	Blank ID	Concentration
Gasoline	240-207248/5	30.6 ug/L

VI. MS/MSD Relative Percent Difference (RPD)

A. SDG # 180-49800 – all MS/MSD RPD criteria were met.

B. SDG #180-49685 - due to RPDs above criteria, the following results are qualified as estimated (UJd/Jd)

- Gasoline in sample SB-3-(11-13)

C. SDG # 180-49745 – all MS/MSD RPD criteria were met

VII. Other Qualifications

A. SDG #180-46965 - The following results are qualified as estimated (Jg).

- GRO in Pile Comp 1

Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

B. SDG #180-49752 – no further qualification were necessary.

C. SDG #180-49798 – no further qualification were necessary.

D. SDG #180-49800 – no further qualification were necessary.

E. SDG #180-46965 - The following results are qualified as estimated (Jg).

- GRO in SB-2-(1-3)

F. SDG #180-46745 - The following results are qualified as estimated (Jg).

- GRO in SB-7-(1-3), SB-17-(1-3), SB-18-(1-3), SB-13-(13-15)

Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

DIESEL RANGE ORGANIC ANALYSIS
(METHOD 8015)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

D. SDG # 180-49800 – all holding times were met.

E. SDG # 180-49685 – all holding times were met.

F. SDG #180-49745 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – all surrogate recoveries were met.

D. SDG # 180-49800 – all surrogate recoveries were met.

E. SDG # 180-49685 – all surrogate recoveries were met.

F. SDG # 180-49745 – due to high surrogate recovery, the following sample result was qualified as estimated (J+a).

- SB-12-(1-3)

III. Blank Spike or Laboratory Control Sample (LCS)

A. SDG #180-46965 - all LCS criteria were met.

B. SDG #180-49752 – all LCS criteria were met.

C. SDG #180-49798 – all LCS criteria were met.

D. SDG # 180-49800 – all LCS criteria were met.

E. SDG # 180-49685 – all LCS criteria were met.

F. SDG #180- 49745 – all LCS criteria were met.

IV. Blank Contamination

A. SDG #180-46965 – all blanks were free of contamination.

B. SDG #180-49752 – all blanks were free of contamination.

C. SDG #180-49798 – all blanks were free of contamination.

D. SDG #180-49800 – all blanks were free of contamination.

E. SDG # 180-49685 – all blanks were free of contamination.

F. SDG # 180-49745 – all blanks were free of contamination.

V. Matrix Spike/Matrix Spike Duplicate

A. SDG # 180-49800 – all MS/MSD criteria were met.

B. SDG # 180-49685 – due to MS/MSD recoveries above criteria, the following results have been qualified as estimated (J+e).

- DRO in sample SB-3-(11-13)

C. SDG # 180-49745 – due to high MSD recovery, the following results have been qualified as estimated (J+e).

- DRO in sample SB-9-(1-3)

VI. MS/MSD Relative Percent Difference (RPD)

A. SDG # 180-49800 – all MS/MSD RPD criteria were met.

B. SDG # 180-49685 – due to MS/MSD RPD above criteria, the following results have been qualified as estimated (Jd).

- DRO in sample SB-3-(11-13)

C. SDG # 180-49745 – due to MS/MSD RPD above criteria, the following results have been qualified as estimated (Jd).

- DRO in sample SB-9-(1-3)

VII. Other Qualifications

A. SDG #180-46965 - no further qualification were necessary.

B. SDG #180-49752 – no further qualification were necessary.

C. SDG #180-49798 – no further qualification were necessary.

D. SDG #180-49800 – no further qualification were necessary. Several samples were analyzed at a dilution due to the abundance of target analytes and/or matrix. The reporting limits have been adjusted accordingly.

E. SDG #180-46965 - The following results are qualified as estimated (Jg).

- DRO in SB-6-(10-12), SB-6D-(10-12), SB-1-(12-14)

F. SDG #180-49800 – no further qualification were necessary. Several samples were analyzed at a dilution due to the abundance of target analytes and/or matrix. The reporting limits have been adjusted accordingly. The following results are qualified as estimated (Jg).

- DRO in SB-7-(1-3), SB-7-(8-10), SB-9-(12-14)

Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

VOLATILE ORGANIC COMPOUNDS ANALYSIS
(Method 8260)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

D. SDG # 180-49800 – all holding times were met.

E. SDG # 180-49685 – all holding times were met.

F. SDG # 180-49745 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – all surrogate recoveries were met.

D. SDG # 180-49800 –Dibromofluoromethane recoveries were outside QC criteria in samples SB-15-(12-14), SB-16-(7-9). The other 3 surrogates were in control. In addition, pH was high in these 2 samples. High pH often results in low recovery of dibromofluoromethane. No qualification, therefore, was necessary.

E. SDG # 180-49685 – all surrogate recoveries were met.

F. SDG # 180-49745 – all surrogate recoveries were met.

III. Internal Standards

A. SDG # 180-49695 – all internal standard criteria was met.

B. SDG # 180-49752 – all internal standard criteria was met.

C. SDG # 180-49798 – all internal standard criteria was met.

D. SDG # 180-49800 – all internal standard criteria was met.

E. SDG # 180-49685 – all internal standard criteria was met.

F. SDG # 180-49745 – all internal standard criteria was met.

IV. Blank Spike or Laboratory Control Sample (LCS)/LCS Duplicate (LCSD)

A. SDG # 180-49695 - all LCS/LCSD criteria were met.

B. SDG # 180-49752 – all LCS/LCSD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD criteria were met.

D. SDG # 180-49800 – Chloroethane failed the recovery criteria high for LCS/LCSD. This compound was not detected in the associated samples. No qualification was necessary

E. SDG # 180-49685 – Chloroethane failed the recovery criteria high for LCS and the MS/MSD. This compound was not detected in the associated samples. No qualification was necessary

F. SDG # 180-49745 – Chloroethane failed the recovery criteria high for LCS and the MS/MSD. This compound was not detected in the associated samples. No qualification was necessary

V. Blank Contamination

A. SDG # 180-49695 - all method blanks were free of contamination.

B. SDG # 180-49752 – all method blanks were free of contamination.

C. SDG # 180-49798 – all method blanks were free of contamination.

D. SDG # 180-49800 – Due to laboratory contamination in the method blank, the following results are considered nondetected (UJb).

- 1,2,4-Trichlorobenzene in samples SB-14-(1-3), SB- 14-(13-15), SB-15-(12-14), SB-15-(1-3), SB-16-(1-3), SB-16-(7-9)

Compound	Blank ID	Concentration
1,2,4-Trichlorbenzene	160830	1.37 µg/kg

The trip blank was free of contamination.

E. SDG # 180-49685 – methylene chloride was detected in the method blank, however, all sample results were ND. Field QC blanks were all ND.

F. SDG # 180-49745 – all method blanks were free of contamination. The trip blank results were all ND.

VI. LCS/LCSD and MS/MSD Relative Percent Difference (RPD)

A. SDG # 180-49695 - all LCS/LCSD RPD criteria were met.

B. SDG # 180-49752 – all LCS/LCSD RPD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD RPD criteria were met.

D. SDG # 180-49800 – all LCS/LCSD RPD criteria were met. All MS/MSD criteria were met.

E. SDG # 180-49685 – all LCS/LCSD RPD criteria were met. All MS/MSD criteria were met.

F. SDG # 180-49745 – all LCS/LCSD RPD criteria were met. All MS/MSD criteria were met.

VII. Other Qualifications

Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

A. SDG # 180-49695 – all results were non-detect.

B. SDG # 180-49752 – all results were non-detect.

C. SDG # 180-49798 – all results were non-detect.

D. SDG # 180-49800 – The following results are qualified as estimated (Jg).

- Benzene detected results reported below the QL in sample SB-15-W.

E. SDG # 180-49685 – The following results are qualified as estimated (Jg).

- 2-butanone, 2-hexanone, acetone, results reported below the QL in sample SB-4-W, SB-6-W, SB-4D-W, SB-2-W.
- Carbon disulfide in SB-4-W, SB-6-W
- Toluene in sample SB-1-(1-3)

F. SDG # 180-49745 – The following results are qualified as estimated (Jg).

- 2-butanone, carbon disulfide, toluene results reported below the QL in sample SB-11-W.
- Acetone and carbon disulfide in SB-13-W
- Carbon disulfide in SB-17-(1-3)
- Toluene in sample SB-18-(13-15)
- 2-butanone, 2-hexanone, toluene in sample SB-7-W
- 2-butanone in sample SB-9-W

Methylene chloride, acetone, and 2-butanone are known laboratory contaminants. Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

SEMIVOLATILE ORGANIC COMPOUNDS ANALYSIS
(Method 8270)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

D. SDG # 180-49800 – all holding times were met.

E. SDG # 180-49685 – all holding times were met.

F. SDG # 180-49745 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – Nitrobenzene-d5 failed above criteria indicating high bias. All results were nondetect, therefore, no qualifications were necessary.

D. SDG # 180-49800 – all surrogate recoveries were met.

E. SDG # 180-49685 – all surrogate recoveries were met.

F. SDG # 180-49745 – due to low surrogate recovery, the following results are qualified as estimated (J-a).

- SVOCs in sample SB-11-W

III. Blank Spike or Laboratory Control Sample (LCS)/LCS Duplicate (LCSD)

A. SDG # 180-49695 - all LCS/LCSD criteria were met.

B. SDG # 180-49752 – all LCS/LCSD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD criteria were met.

D. SDG # 180-49800 – all LCS/LCSD criteria were met.

E. SDG # 180-49685 – all LCS/LCSD criteria were met.

F. SDG # 180-49745 – all LCS/LCSD criteria were met.

IV. MS/MSD Recovery

A. SDG # 180-49745 – due to low recovery in the MS/MSD, the following results are qualified as estimated (J-e).

- Anthracene, benzo(k)fluoranthene, dibenz(a,h)anthracene in sample SB-9-(1-3)

V. Blank Contamination

A. SDG # 180-49695 - all blanks were free of contamination.

B. SDG # 180-49752 – all blanks were free of contamination.

C. SDG # 180-49798 – all blanks were free of contamination.

D. SDG # 180-49800 – all blanks were free of contamination.

E. SDG # 180-49685 – Due to field blank contamination, the following results are considered nondetected (UJf).

- Naphthalene and phenanthrene in samples SB-4-W, SB-4D-W

Compound	Blank ID	Concentration, µg/L
Antthracene	FB-111015	0.045
Fluoranthene		0.069
Fluorene		0.08
Naphthalene		0.13
Phenanthrene		0.24

The method blank was free of contamination.

F. G # 180-49745 – all blanks were free of contamination.

VI. LCS/LCSD and MS/MSD Relative Percent Difference (RPD)

A. SDG # 180-49695 - all LCS/LCSD RPD criteria were met.

B SDG # 180-49752 – all LCS/LCSD RPD criteria were met.

C. SDG # 180-49798 – Due to RPD outside criteria, the following results are considered estimated (UJd/Jd).

- Pyridine in samples Soil Comp 1 and WST 1

D. SDG # 180-49800 – all LCS/LCSD RPD criteria were met.

E. SDG # 180-49685 – all LCS/LCSD RPD criteria were met.

F. SDG # 180-49745 – Due to MS/MSD RPD outside criteria, the following results are considered estimated (UJd/Jd).

- Benzo(k)fluoranthene in sample SB-9-(1-3)

VII. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All SVOC detected results reported below the QL.

  Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection. Several samples were analyzed at a dilution. Reporting limits were adjusted accordingly.

PESTICIDE ANALYSIS
(METHOD 8081)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – all surrogate recoveries were met.

III. Blank Spike or Laboratory Control Sample (LCS)/LCSD

A. SDG # 180-49695 - all LCS/LCSD criteria were met.

B SDG # 180-49752 – al all LCS/LCSD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD criteria were met.

IV. Blank Contamination

A. SDG # 180-49695 - all blanks were free of contamination.

B. SDG # 180-49752 – all blanks were free of contamination.

C. SDG # 180-49798 – all blanks were free of contamination.

V. LCS/LCSD Relative Percent Difference (RPD)

A. SDG # 180-49695 - all LCS/LCSD RPD criteria were met.

B SDG # 180-49752 – all LCS/LCSD RPD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD RPD criteria were met.

VI. Other Qualifications

Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

A. SDG # 180-49695 – all results were non-detect.

B. SDG # 180-49752 – all results were non-detect.

C. SDG # 180-49798 – all results were non-detect.

POLYCHLORINATED BIPHENYLS CONGENER ANALYSIS
(METHOD 8082)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

D. SDG # 180-49800 – all holding times were met.

E. SDG # 180-49685 – all holding times were met.

F. SDG # 180-49745 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – all surrogate recoveries were met.

D. SDG # 180-49800 – all surrogate recoveries were met.

E. SDG # 180-49685 – all surrogate recoveries were met

F. SDG # 180-49745 – due to surrogate recoveries above criteria, the following detected results are qualified as estimated (J+a).

- PCB-1260 in sample SB-13-(1-3)

Due to surrogate recoveries below criteria, the following results are qualified as estimated (UJ-a/J-a).

- All aroclors in sample SB-13-(13-15)

III. Blank Spike or Laboratory Control Sample (LCS)/LCSD

A. SDG # 180-49695 – LCS only analyzed, all recoveries were met.

B. SDG # 180-49752 – LCS only analyzed, all recoveries were met.

C. SDG # 180-49798 – LCS only analyzed, all recoveries were met.

D. SDG # 180-49800 – Due to LCS/LCSD recoveries above criteria, the following detected sample results have been qualified as estimated (J+e).

- Aroclor-1260 in SB-15-(1-3), SB-15-W

E. SDG # 180-49685 –all LCS/LCSD recoveries were met.

F. SDG # 180-49745 – LCS only analyzed, all recoveries were met. All MS/MSD recoveries were met.

IV. Blank Contamination

A. SDG # 180-49695 - all blanks were free of contamination.

B. SDG # 180-49752 – all blanks were free of contamination.

C. SDG # 180-49798 – all blanks were free of contamination.

D. SDG # 180-49800 – all blanks were free of contamination.

E. SDG # 180-49685 – all blanks were free of contamination.

F. SDG # 180-49745 – all blanks were free of contamination.

V. LCS/LCSD Relative Percent Difference (RPD)

A. SDG # 180-49695 – LCS only analyzed.

B. SDG # 180-49752 – LCS only analyzed. .

C. SDG # 180-49798 – LCS only analyzed.

D. SDG # 180-49800 – all LCS/LCSD RPD criteria were met.

E. SDG # 180-49685 – all LCS/LCSD RPD criteria were met.

F. SDG # 180-49745 – LCS only analyzed, all MS/MSD RPD criteria were met.

VI. Compound Identification

A. SDG # 180-49695 – All confirmation criteria were met.

B. SDG # 180-49752 – All confirmation criteria were met.

C. SDG # 180-49798 – Due to confirmation problems, the following sample results were qualified as estimated (Jj/UJj).

- All PCB results in samples SOIL COMP 3, WST 1

The results for samples SOIL COMP 3 and WST 1 were reported for aroclor 1260 from the back column since front column had high % recovery and results within 40% D.

D. SDG # 180-49800 – All confirmation criteria were met.

E. SDG # 180-49685 – All results were ND.

F. SDG # 180-49745 – All confirmation criteria were met.

VII. Other Qualifications

A. SDG #180-46965 - no further qualification were necessary.

B. SDG #180-49752 – no further qualification were necessary.

C. SDG #180-49798 – no further qualification were necessary.

D. SDG #180-49800 – no further qualification were necessary.

E. SDG #180-49685 – no further qualification were necessary.

F. SDG #180-49745 – no further qualification were necessary.

HERBICIDE ANALYSIS
(METHOD 8151)

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

II. Surrogate Recovery

A. SDG # 180-49695 - all surrogate recoveries were met.

B. SDG # 180-49752 – all surrogate recoveries were met.

C. SDG # 180-49798 – all surrogate recoveries were met.

III. Blank Spike or Laboratory Control Sample (LCS)/LCSD

A. SDG # 180-49695 - all LCS/LCSD criteria were met.

B SDG # 180-49752 – al all LCS/LCSD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD criteria were met.

IV. Blank Contamination

A. SDG # 180-49695 - all blanks were free of contamination.

B. SDG # 180-49752 – all blanks were free of contamination.

C. SDG # 180-49798 – all blanks were free of contamination.

V. LCS/LCSD Relative Percent Difference (RPD)

A. SDG # 180-49695 - all LCS/LCSD RPD criteria were met.

B SDG # 180-49752 – all LCS/LCSD RPD criteria were met.

C. SDG # 180-49798 – all LCS/LCSD RPD criteria were met.

VI. Other Qualifications

Detected results reported below the QL are considered to be qualitatively acceptable, but quantitatively unreliable due to the uncertainty in analytical precision near the limit of detection.

A. SDG # 180-49695 – all results were non-detect.

B. SDG # 180-49752 – all results were non-detect.

C. SDG # 180-49798 – all results were non-detect.

METALS ANALYSIS

I. Holding Times

A. SDG # 180-49695 - all holding times were met.

B. SDG # 180-49752 – all holding times were met.

C. SDG # 180-49798 – all holding times were met.

D. SDG # 180-49800 – all holding times were met.

E. SDG # 180-49685 – all holding times were met.

F. SDG # 180-49745 – all holding times were met.

II. Blank Contamination

A. SDG # 180-49695 - all blanks were free of contamination.

B. SDG # 180-49752 – all blanks were free of contamination.

C. SDG # 180-49798 – barium was detected in the TCLP method blanks at very low levels, and detections in the samples were well above 5X the blank contamination, therefore, qualification was not necessary.

D. SDG # 180-49800 – iron, manganese, and zinc were detected in the soil method blanks, and aluminum, potassium, and sodium were detected in the water method blanks, at very low levels. Detections in the samples were well above 5X the blank contamination, therefore, qualification was not necessary.

E. SDG # 180-49685 – chromium and potassium were detected in the soil method blanks, and magnesium and sodium were detected in the water method blanks, at very low levels. Detections in the samples were well above 5X the blank contamination, therefore, qualification was not necessary. A few metals were detected in the field and equipment blanks, however, sample results were either ND or 5X greater than the blank contamination.

F. SDG # 180-49745 – chromium, barium, chromium, iron, and manganese were detected in the soil method blanks, and magnesium, potassium, and sodim were detected in the water method blanks, at very low levels. Detections in the samples were well above 5X the blank contamination, therefore, qualification was not necessary.

III. Blank Spike or Laboratory Control Sample (LCS)

A. SDG # 180-49695 - all LCS criteria were met.

B. SDG # 180-49752 – all LCS criteria were met.

C. SDG # 180-49798 – all LCS criteria were met.

D. SDG # 180-49800 – all LCS criteria were met.

E. SDG # 180-49685 – all LCS criteria were met.

F. SDG # 180-49745 – all LCS criteria were met.

IV. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A. SDG # 180-49800 – due to low recovery in the MS/MSD, the following results are qualified estimated (UJ-e/J-e).

- Antimony, calcium, copper, lead, silver, zinc in sample SB-15-(1-3)

B. SDG # 180-49685 – all MS/MSD criteria were met.

C. SDG # 180-49745 – due to low recovery in the MS/MSD, the following results are qualified estimated (UJ-e/J-e).

- Antimony, calcium, magnesium in sample SB-9-(1-3)

Due to high recovery in the MS/MSD, the following results are qualified estimated (J+e).

- Barium, chromium, copper, lead, zinc in sample SB-9-(1-3)

V. MS/MSD RPD

A. SDG #180-49800 – due to RPDs above criteria, the following results are qualified as estimated (UJd/Jd)

- Antimony, calcium, copper, lead, silver, zinc in sample SB-15-(1-3)

B. SDG #180-49685 – due to RPDs above criteria, the following results are qualified as estimated (UJd/Jd)

- Mercury in sample SB-3-(11-13)

C. SDG #180-49745 – due to RPDs above criteria, the following results are qualified as estimated (UJd/Jd)

- Aluminum, barium, calcium, chromium, copper, iron, lead zinc in sample SB-3-(11-13)

VI. Other Qualifications

A. The following results are qualified as estimated (Jg).

- All metals results reported below the QL.

Results above the MDL but below the QL are considered qualitatively acceptable but quantitatively unreliable due to uncertainties in the analytical precision near the limit of detection. Some samples required dilution, reporting limits were elevated accordingly.

OVERALL ASSESSMENT OF DATA

I. Method Compliance and Additional Comments

All analyses were conducted within all specifications of the requested methods.

II. Usability

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Rejected sample results (R) are unusable for all purposes. Estimated sample results (J) are usable only for limited purposes. Based upon the data validation all results are considered valid and usable for all purposes. No data was rejected. In general, the absence of rejected data and the small number of qualifiers added to the data indicate high usability.

MEMO

TO:	Adrienne McCray			**DATE**:	10-Jul-2009
COMPANY:	Lee + Papa and Associates, Inc.			**By:**	Mike McGrew
	638 Eye St., NW			**PROJECT:**	Kingman Island
	Washignton, DC 20001			**JOB NO.:**	1396
PHONE:	2024666666	**FAX:**	2024664232	**CC:**	Chuck Dixon
RE:	Craig Atkins				

REMARKS:

Site observations

Site visit was performed on July 6, 2009. Collected information about site conditions and georeferenced the locations using GPS data, photographs, plant identification, and collection of soil samples at three different locations.

Soil Boring locations

The site was walked in the location of the proposed memorial grove-with particular attention to the large mounds of deposited material-and along the pathways of the proposed outdoor classrooms. The surface materials were inspected for changes of color, structure, texture, composition, and saturation. Waypoints were identified for potential soil boring locations and samples were taken for laboratory evaluation. From the visual surface inspection and the lab evaluation, a series of six soil boring locations have been recommended for further testing. In particular, we would prefer to see soil boring logs that record changes of color, soil classification, pollutants, their respective depths, and the relative depth of ground water.

Recommended soil boring locations are as follows:

type	ident	lat	long	lat (dms)	long (dms)
WAYPOINT	107	38.8942	-76.9637	N 38° 53' 39.12"	W 76° 57' 49.32"
WAYPOINT	108	38.8939	-76.9640	N 38° 53' 38.04"	W 76° 57' 50.40"
WAYPOINT	109	38.8937	-76.9637	N 38° 53' 37.32"	W 76° 57' 49.32"
WAYPOINT	112	38.8920	-76.9641	N 38° 53' 31.20"	W 76° 57' 50.76"
WAYPOINT	114	38.8951	-76.9644	N 38° 53' 42.36"	W 76° 57' 51.84"
WAYPOINT	116	38.8941	-76.9635	N 38° 53' 38.76"	W 76° 57' 49.00"

From this, we can further determine the composition of the soil and provide information as to the re-use of soils on site to minimize the amount of imported materials. Please note that the recommended soil boring locations are available in digital format as a .csv file. Alternate digital formats (including .shp and .txt) are also available on request. If cost or time is an issue, JBC can prioritize the six soil boring locations by importance.

Additional Request

There was an old, possibly unused vault on the site along the east path, SE of the mounds, NNE of waypoint 112. We would like to know what this vault holds as any pollutants in the vault may be exposed

JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

and leaking into the soil media in the area. There has been no initial indication that the soil in the area requires remediation, but we would prefer to have it inspected in order to make recommendations for the area.

Denaturing propagation material and recommendations for reuse.

The site has a high amount of biomass. This material is largely comprised of materials that will not be utilized in the final design. There is an opportunity that this material can be reused as a mulch if the denaturing process is properly managed. A regimen of Roundup® or approved alternate can reduce the material on site without long-term adverse effects on the soil profile or riparian areas. An application of VermiPlex or apparoved equal can restore biological balance to the remaining soil prior to planting of new material. The woody shrubs and trees can be cut and burned in a pile at 106ºF on or near site. Chemically hazardous plantings such as poison ivy will need to be separately disposed of and remediation methods will need to be reviewed.

Potential use of soils, including grading and hardscape

After observation, the south mound of deposited material does have a higher organic content than the north mound. The initial tests indicate that organic content in the pile (18.43% at Waypoint107 may not be as high as expected. The structure of the south mound is quite loose, but there is an opportunity to use the north mound to provide structure to a blended north/south mound soil. The potential use of on-site soils for the proposed programmed use is still quite high.

Initial estimates that 50% of the existing soil material on site is viable material that can be reutilized for rough grading or as a prepared soil type. This is a very abstracted approximation. This number can be less abstracted with soil boring tests in the piles. The initial lab tests indicate the soil material has a relatively high percentage of gravel material. There is a potential use of this gravel as a base material for sidewalks, and roadways.

Planting Palette Indications

Initial testing at waypoint 109 and 112 indicate that the surface is sandy loam and sandy clay loam. We can make further recommendations for the site with additional soil testing, however there is an indication that soil material can be re-used for a native riparian palette. Certain plantings may require utilizing imported materials, but we can make recommendations for developing amended soil pits for individual plantings if the case arises.

Projected schedule

LP+A has stated they have a 75% deadline on August 21st. JBC would like to provide its full recommendations by Friday, July 31st. Additional lab results from recommended soil borings are required by July 27th. There is a strong possibility that the soil boring tests may not be performed by this date due to permitting issues, but JBC can make recommendations on their findings without the boring report. The boring report can be used to solidify assumptions. Please note that unknown conditions may still exist underneath the surface due to the possibility of soil variation. This is particularly true in materials that have been extensively worked and deposited by humans.

Attachments

-Selected waypoints of suggested soil boring locations. (digitally provided in .csv format as well)

JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

MEMO

-Aerial photographs of suggested soil boring locations and photographs of approximate site locations. No photograph provided for WP116.

Please contact our office if you have any further questions.

Signed: Mike McGrew

Jeffrey L. Bruce & Company

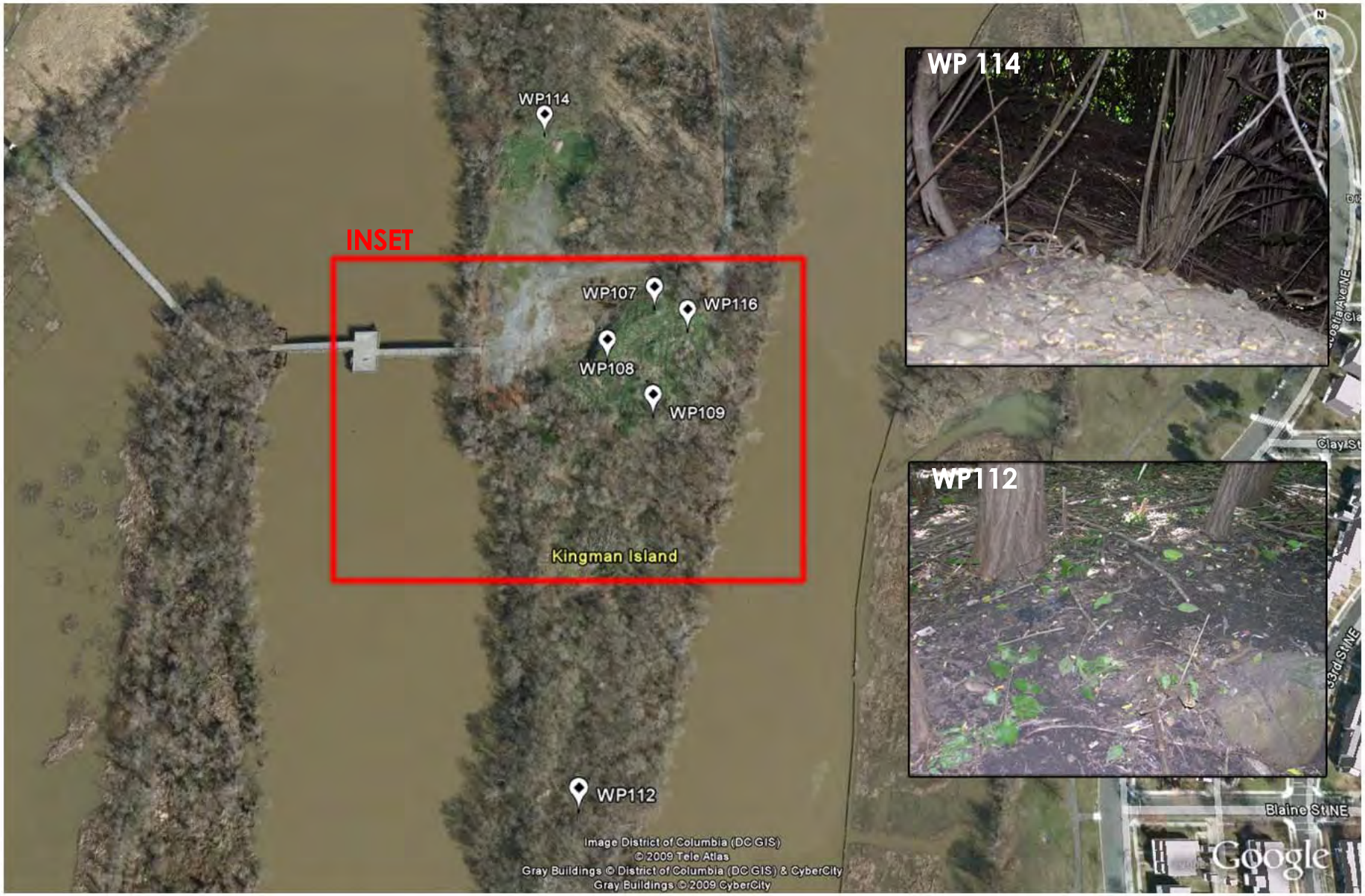
JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

WAYPOINT DATA - KINGMAN ISLAND - 06 July 2009

type	ident	lat	long	y_proj	x_proj	comment	display	symbol	unused1	dist	prox_index	color	altitude	depth	wpt_class	sub_class	attrib	link	state	country	city	address	facility	crossroad	unused2	ete	dtype	model	filename
WAYPOINT	107	38.8942	-76.9637	38.8942	-76.9637	06-JUL-09 1:30:03PM	0	8284	0	0	0	31	46	0	0		128								0	-1	1	GPSMap60CSX	
WAYPOINT	108	38.8939	-76.9640	38.8939	-76.9640	06-JUL-09 1:36:52PM	0	8284	0	0	0	31	48	0	0		128								0	-1	1	GPSMap60CSX	
WAYPOINT	109	38.8937	-76.9637	38.8937	-76.9637	06-JUL-09 1:47:15PM	0	8284	0	0	0	31	45	0	0		128								0	-1	1	GPSMap60CSX	
WAYPOINT	112	38.8920	-76.9641	38.8920	-76.9641	06-JUL-09 2:05:28PM	0	8284	0	0	0	31	41	0	0		128								0	-1	1	GPSMap60CSX	
WAYPOINT	114	38.8951	-76.9644	38.8951	-76.9644	06-JUL-09 2:40:55PM	0	8284	0	0	0	31	35	0	0		128								0	-1	1	GPSMap60CSX	
WAYPOINT	116	38.8941	-76.9635	38.8941	-76.9635		0	8284	0	0	0	31		0	0		128								0	-1	1	GPSMap60CSX	

Jeffrey L. Bruce & Company, LLC
1907 Swift Street • Suite 204 • North Kansas City, Missouri 64116
Phone 816.842.8999 • Fax 816.842.8885 • www.jlbruce.com

Recommended Soil Boring Locations (Photographs show approximate locations of waypoints)



JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

Recommended Soil Boring Locations (Photographs show approximate locations of waypoints)

JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

MEMO

TO:	Adrienne McCray		
COMPANY:	Lee + Papa and Associates, Inc.		
	638 Eye St., NW		
	Washignton, DC 20001		
PHONE:	2024666666	**FAX:**	2024664232
RE:	Craig Atkins		

DATE:	16-Sep-2009
By:	Mike McGrew
PROJECT:	Kingman Island
JOB NO.:	1396
CC:	Chuck Dixon

OBSERVATIONS AND RECOMMENDATIONS

The following is an categorized list of observations and recommendations for the use of existing soils at Kingman Island. These observations are drawn from a site visit performed on July 6th, 2009, soil boring tests taken by ECS geotechnical, soils tests performed by Turf Diagnostics and Design laboratory, and review of soil boring samples delivered from the site to our office.

The mound soils contain an upper layer of sandy loam soils with a higher organic content than other observed soils on site. These soils are approximately 15'-20' deep at the top of the south mound. This upper layer of soil does have a large amount of urban debris that need to be removed prior to use. There are four potential options for this soil:

1) All materials that are larger than ¼" or ½' in size should be screened from this soil and removed. This screened soil media can be utilized in grass/meadow areas, small shrubs, and other understory plants to a depth of 8"-10". It is not recommended that this soil media be used for tree pits or large plantings as it may not have enough structural stability in high wind situations, even with staking.

2) As in option 1, all materials that are larger than ¼" or ½' in size should be screened from this soil and removed. This screen soil media would be used as a veneer soil approximately 2"-3" in depth across all landscape areas. A layer of import soil would be provided underneath this veneer soil approximately 6"-8" in depth for small plantings, and underneath tree pits at depths reflective of tree size (roughly 24" in depth).

3) As in option 1, all materials that are larger than ¼" or ½' in size should be screened from this soil and removed. This soil can then be blended with another soil to improve the organic matter content of the soil. The rate would be determined by the property of the other soil blended in (consider the use of silty loam to sandy loam import soil as a blending media). Organic content can also be improved by a well decomposed compost void of bio-solid waste and heavy metals from industrial wastes. Compost should have no more than 40% organic matter derived from wood products and have 60% passing a half inch screen. Compost shall be aged and have been processed through the Mesophilic and Thermophilic decomposition phases. Compost stability shall be determined with the SOLVITA analysis for decomposition status. SOLVITA classification shall not be less than 5. This blended soil media can be used in groves, tree pits, and other areas of larger biomass plantings.

4) The removal of the top layer of material. The soil is marginal in comparison to other higher quality soil media, and a cost-benefit analysis should be performed to determine if

JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

on-site blending/screening, storage, and placement of the soil is more or less expensive than removal and import of new soil.

Under the upper layer of soils (approximately 15'-20' deep) is a layer of soils with high gravel content and silty clay. This media would be best utilized for mass grading. These soils should be below tree pit level due to its poor drainage and lower organic content. If this soil layer is cut into with a tree well and backfilled with another soil, it will create a "bathtub" effect in the tree well unless there is a subdrainage solution. Consider the shaping of this lower layer of soils to allow for effective drainage away from any tree wells.

The four options for the top layer provided are for the review of LP+A. Our recommended local source for materials and materials costing is below:

Stancills, Inc.
499 Mountain Hill Road
Perryville, MD 21903

Terry Stancill: president

877-536-9572

JBC can provide soils design documents with details as needed for the site after direction from LP+A. Please contact our office if you have any further questions.

Signed: Mike McGrew
Jeffrey L. Bruce & Company

JEFFREY L. BRUCE & COMPANY, LLC
1907 SWIFT STREET • SUITE 204 • NORTH KANSAS CITY, MISSOURI 64116
PHONE 816.842.8999 • FAX 816.842.8885 • www.jlbruce.com

KINGMAN ISLAND
ANACOSTIA RIVER
WASHINGTON D.C.

SUBSURFACE EXPLORATION NOTES

1. EXPLORATION WAS PERFORMED DURING AUGUST 2005.

2. DRILL HOLES (DH) WERE ACCOMPLISHED BY STANDARD PENETRATION TEST PROCEDURE (SPT, ASTM - 1586) USING A 1-3/8"ID SPLIT SPOON SAMPLER. SAMPLE SPOONS WERE ADVANCED BY A 140# HAMMER FALLING 30". THESE HOLES WERE POWER AUGERED BETWEEN SAMPLES UNLESS OTHERWISE INDICATED. BLOW COUNTS SHOWN ARE FOR 0.5' OF DRIVE, UNLESS OTHERWISE INDICATED.

   DRILL HOLES DH-1, DH-2, DH-3, DH-6, DH-7, DH-8 & DH-9 WERE DRILLED BY A CME 45.

   DRILL HOLES DH-4, DH-5, DH-10 & DH-11 WERE DRILLED BY A MOBILE CATHEAD RIG MOUNTED ON A BARGE. THE RIVER SEDIMENTS WERE COLLECTED CONTINUOUSLY THROUGH A 4" ID CASING BY SPT METHOD. THE CASING WAS CONTINUOUSLY ADVANCED BY DRIVING IT WITH A 140 LB. HAMMER WHILE JETTING WATER UNDER PRESSURE.

   WH - DENOTES WEIGHT OF HAMMER

   WR - DENOTES WEIGHT OF ROD

3. BLOW COUNTS REQUIRED TO ADVANCE SAMPLE SPOON ARE SHOWN IN COLUMN (a).

4. SOIL DESCRIPTIONS ARE SHOWN IN COLUMN (c).

5. SOIL DESCRIPTIONS ARE LABORATORY CLASSIFICATIONS BASED ON THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487/2488), EXCEPT THOSE INDICATED THUS (**), WHICH ARE FIELD INSPECTOR'S CLASSIFICATIONS.

6. GROUNDWATER DEPTHS ARE INDICATED ON THE LOGS AS ▽, ▼ & ▼ ARE SHOWN IN COLUMN (d). PERTINENT DATA FOR THESE READINGS ARE SHOWN AT THE BOTTOM OF LOG UNDER GROUNDWATER DATA OR ADDITIONAL GROUNDWATER DATA. THESE READINGS MAY VARY DEPENDING UPON SEASONS AND AMOUNT OF RAINFALL.

   NE - INDICATES GROUNDWATER NOT ENCOUNTERED

   NT - INDICATES GROUNDWATER READING NOT TAKEN

7. A SOUNDING OF ANACOSTIA RIVER WAS PERFORMED USING A WEIGHTED MEASURING TAPE PRIOR TO SAMPLING. THE SAMPLES AND LOGS WERE RECORDED USING THE RIVER BOTTOM AS THE STARTING POINT FOR THE SPT RUNS.

8. FOR LOCATIONS OF SUBSURFACE EXPLORATIONS, SEE BORING LOCATION PLAN.

STA.
OFFSET:
TOP ELEV:

KINGMAN ISLAND
ANACOSTIA RIVER - WASHINGTON, D.C.

N 447035.30
E 1321882.10 ← COORDINATES

DH-1
1 of 1

COMPLETED: August 18, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
3.00	Sl. moist, dk. gray brown, silty SAND* w/gravel (SM)		6-9-12	
			12-15-20	
4.50	Moist, dk. brown, silty SAND* w/gravel (SM)		18-12-7	
6.00	Sl. moist, dk. gray brown, silty SAND* w/gravel (SM)		1-2-2	
7.50	Moist, dk. gray brown, clayey SAND w/tr. of gravel (SC)		1-WH-WH	
9.00	Moist, yellow brown, lean CLAY w/sand (CL)		1-2-WH	
10.50	Moist, dk. gray brown, lean CLAY w/sand (CL)		WH-WH-WH	
12.00	Moist, brown, lean CLAY w/sand (CL)		WH-WH-WH	
	BOTTOM OF HOLE			

* {Contains glass fragments}

5
10
15
20

DH-1
GROUNDWATER DATA
WHILE DRILLING: NE
ON COMPLETION: DRY
24 Hr. READING: DRY

Fill | Auger | SPT | RB
Cored | 300 lb | Tubex | Hand
Fish Tail | Vibra Core | Water Jet | Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 446997.00 **DH-2**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1321926.60 **1 of 1**

TOP ELEV: COMPLETED: August 18, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Sl. moist, dk. gray brown, silty SAND {1} w/gravel (SM)		5-8-6	
3.00	Moist, v. dk. gray brown, clayey SAND {1,2} w/gravel (SC)		13-21-10	
4.50	Moist, dk. brown, clayey SAND {1,2} w/gravel (SC)		4-3-3	
6.00	Moist, brown, sandy, lean CLAY {2} w/tr. of gravel (CL)		1-1-2	
7.50	Moist, dk. yellow brown, clayey SAND {2} w/gravel (SC)		WH-WH-1	
10.50	Moist, yellow brown, lean CLAY w/sand (CL)		WH-WH-WH	
12.00	Moist, gray brown, lean CLAY w/sand (CL)		WH-WH-WH	
	BOTTOM OF HOLE			

{1} Contains glass fragments
{2} Contains red brick fragments

5
10
15
20

DH-2
GROUNDWATER DATA
WHILE DRILLING: NE
ON COMPLETION: DRY
24 Hr. READING: DRY

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 446995.20 **DH-3**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1322001.80 **1 of 1**

TOP ELEV: COMPLETED: August 18, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
	Moist, v. dk. gray brown, silty SAND* w/gravel (SM)		4-8-8	
3.00			15-8-7	
	Moist, dk. gray brown, lean CLAY w/sand w/tr. of gravel (CL)		2-1-2	
			1-1-2	
6.00				
	Moist, gray brown, lean CLAY w/sand (CL)		1-1-1	
			1-WH-WH	
			WH-WH-WH	
			WH-WH-WH	
12.00				
	BOTTOM OF HOLE			
	* {Contains glass fragments}			

5 — 10 — 15 — 20

DH-3
GROUNDWATER DATA
WHILE DRILLING: NE
ON COMPLETION: DRY
24 Hr. READING: DRY

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 447014.70 **DH-4**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1322162.60 **1 of 1**

TOP ELEV: COMPLETED: August 22, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	V. moist, brown, lean CLAY w/sand (CL)		WR-WR-WR	
6.00	Wet, gray brown, fat CLAY w/sand (CH)		WR-WR-WR WR-WR-WR WR-WR-WR	
7.50	Wet, dk. gray, fat CLAY w/sand (CH)		WR-WR-WR	
12.00	V. moist, gray brown, fat CLAY w/tr. of sand (CH)		WR-WR-WR WR-WR-WR WR-WR-WR	
15.00	V. moist, dk. gray brown, lean to fat CLAY w/tr. of sand (CL/CH)		WR-WH-WH WR-WH-WH	
16.50	Moist, v. dk. gray brown, fat CLAY w/tr. of sand & roots (CH)		WR-WH-WH	
18.00	Moist, gray brown, sandy, lean CLAY (CL/SC)		WH-1-4	
20.00	Wet, gray brown, silty, fine SAND (SM)		1-2-2-6	
	BOTTOM OF HOLE			

5 — 10 — 15 — 20

Depth of water 3.0' @ start of boring.

Hole was moved approximately 23' south & 4' west from location shown on drilling plan dated 4/29/04.

DH-4
GROUNDWATER DATA
WHILE DRILLING: NT
ON COMPLETION: NT
24 Hr. READING: NT

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA.
OFFSET:
TOP ELEV:

KINGMAN ISLAND
ANACOSTIA RIVER - WASHINGTON, D.C.

N 446941.80
E 1322120.30
COMPLETED: August 23, 2005

DH-5
1 of 1

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Wet, yellow brown, lean CLAY w/sand (CL)		WR-WR-WR	
3.00	Moist, dk. gray brown, fat CLAY w/tr. of sand (CH)		WR-WR-WR	
4.50	Wet, gray brown, fat CLAY w/tr. of sand (CH)		WR-WR-WR	
7.50	Wet, dk. gray brown, fat CLAY w/tr. of sand (CH)		5 WR-WR-WR	
			WR-WR-WR	
9.00	Wet, dk. gray, fat CLAY w/tr. of sand (CH)		WR-WR-WR	
12.00	Wet, dk. gray brown, fat CLAY w/tr. of sand (CH)		10 WR-WR-WR	
			WR-WH-WH	
15.00	Moist, v. dk. gray brown, fat CLAY* w/tr. of sand (CH)		WH-WH-WH	
			WH-WH-1	
16.50	V. moist, gray brown, lean CLAY w/sand (CL)		15 WH-WH-1	
20.00	Wet, gray brown, silty, fine SAND (SM)		2-1-3	
			4-3-4-I	
	BOTTOM OF HOLE		20	

* {Contains organic material}

Depth of water 5.5' @ start of boring.

Hole was moved approximately 20' south & 20' west from location shown on drilling plan dated 4/29/04.

DH-5
GROUNDWATER DATA
WHILE DRILLING: NT
ON COMPLETION: NT
24 Hr. READING: NT

Fill | Auger | SPT | RB
Cored | 300 lb | Tubex | Hand
Fish Tail | Vibra Core | Water Jet | Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA.
OFFSET:
TOP ELEV:

KINGMAN ISLAND
ANACOSTIA RIVER - WASHINGTON, D.C.

N 447683.10
E 1322546.30

DH-6
1 of 1

COMPLETED: August 18, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Moist, brown, clayey SAND w/gravel & tr. of roots (SC)		7-10-11	
3.00	Sl. moist, lt. gray, silty SAND w/gravel (SM)		33-66-50	
4.50	Sl. moist, v. pale brown, silty SAND w/gravel (SM)		27-60-23	
6.00	Moist, yellow brown, poorly graded SAND w/silt & gravel (SP-SM/SM)		10-23-6	
7.50	Moist, dk. yellow brown, clayey SAND w/gravel (SC)		11-5-7	
9.00	Moist, yellow brown, clayey SAND w/gravel (SC)		6-6-5	
10.50	Moist, yellow brown, sandy, lean CLAY w/gravel (CL/SC)		2-3-5	
12.00	Moist, yellow brown, sandy, lean CLAY w/gravel (CL)		11-7-9	
	BOTTOM OF HOLE			

5
10
15
20

DH-6
GROUNDWATER DATA
WHILE DRILLING: NE
ON COMPLETION: DRY
24 Hr. READING: DRY

Fill | Auger | SPT | RB
Cored | 300 lb | Tubex | Hand
Fish Tail | Vibra Core | Water Jet | Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 447613.10 **DH-7**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1322618.40 **1 of 1**

TOP ELEV: COMPLETED: August 19, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Moist, yellow brown, clayey SAND w/gravel & tr. of roots (SC)		4-16-6	
2.00	Sl. moist, yellow brown, clayey SAND w/gravel (SC)		40-50/.0	
3.00	Possibly hit a piece of concrete? (FILL)			
6.00	Moist, yellow brown, silty SAND w/gravel (SM)		13-24-30 17-15-16	
7.50	Moist, strong brown, sandy, lean CLAY w/tr. of gravel (CL)		10-14-14	
9.00	Moist, dk. yellow brown, clayey SAND w/gravel (SC)		11-6-6	
10.50	Moist, dk. yellow brown, clayey SAND w/gravel (SC/CL)		2-2-3	
12.00	Moist, gray brown, sandy, lean CLAY w/tr. of gravel (CL)		1-1-1	
	BOTTOM OF HOLE			

5 10 15 20

DH-7
GROUNDWATER DATA
WHILE DRILLING: NE
ON COMPLETION: DRY
24 Hr. READING: DRY

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 447504.80 **DH-9**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1322731.30 **1 of 1**

TOP ELEV: COMPLETED: August 19, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Moist, strong brown, clayey SAND w/gravel (SC)		3-8-11	
3.00	Moist, dk. yellow brown, sandy, lean CLAY w/tr. of gravel (CL)		3-5-5	
4.50	Moist, dk. yellow brown, silty SAND {1} w/gravel (SM)		4-15-4	
6.00	Moist, gray brown, clayey SAND {2} w/gravel (SC)		3-23-26	
7.50	Moist, gray brown to yellow brown, clayey SAND {3} w/gravel (SC/CL)		16-15-7	
9.00	Moist, gray brown, clayey SAND {3} w/gravel (SC)		3-5-11	
10.50	Moist, yellow brown, clayey SAND {3} w/gravel (SC)	▽	10-9-5	
12.00	Wet, dk. gray brown, clayey SAND {3} w/gravel (SC)	▼	7-6-5	
	BOTTOM OF HOLE			

{1} Sample is mostly organic material
{2} Contains organic material & red brick fragments
{3} Contains organic material

5 — 10 — 15 — 20

DH-9
GROUNDWATER DATA
▽ WHILE DRILLING: 10.0
▼ ON COMPLETION: 11.0
24 Hr. READING:

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 448005.60 **DH-10**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1323006.30 **1 of 1**

TOP ELEV: COMPLETED: August 18, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Dry, pale brown, silty SAND w/gravel & tr.of roots (SM)		1-1-2	
3.00	Moist, v. dk. gray brown, elastic SILT* w/sand (MH)		1-WH-1	
7.50	Moist, dk. gray brown, fat CLAY w/tr. of sand (CH)		1-1-WH WH-WH-WH WR-WR-WR	
9.00	No Sample		WR-WR-WR	
12.00	Wet, v. dk. gray brown, elastic SILT* w/sand (MH)		WH-WH-WH WH-WH-WH	
18.00	V. moist, dk. gray brown, fat CLAY w/tr. of sand (CH)		WH-WH-WH WH-WH-WH WH-WH-WH WH-WH-1	
20.00	Wet, dk. gray brown, sandy, lean CLAY w/tr. of gravel (CL)		1-1-1-3	
	BOTTOM OF HOLE			

5 10 15 20

* {Contains organic material}

Depth of water 5.3' @ start of boring.

DH-10
GROUNDWATER DATA
WHILE DRILLING: NT
ON COMPLETION: NT
24 Hr. READING: NT

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

STA. KINGMAN ISLAND N 447519.20 **DH-11**

OFFSET: ANACOSTIA RIVER - WASHINGTON, D.C. E 1322277.20 **1 of 1**

TOP ELEV: COMPLETED: August 23, 2005

DEPTH(ft)	(c)	(d)	(a)	(b)
1.50	Wet, dk. gray, lean CLAY w/sand (CL)		WR-WR-WR	
6.00	Wet, gray brown, fat CLAY w/tr. of sand (CH)		WR-WR-WR WR-WR-WR WR-WR-WR	
7.50	Wet, dk. gray brown, fat CLAY w/tr. of sand (CH)		WR-WR-WH	
10.50	V. moist, dk. gray brown, fat CLAY w/tr. of sand (CH)		WR-WH-WH WR-WH-WH	5 10
12.00	V. moist, dk. gray brown, fat CLAY* w/tr. of sand (CH)		WH-WH-WH	
13.50	Wet, v. dk. gray brown, fat CLAY* w/tr. of sand (CH)		WH-WH-WH	
16.50	Wet, v. dk. gray brown, elastic SILT* w/sand (MH)		WH-WH-WH WR-WH-WH	15
18.00	Wet, gray brown, clayey SAND w/tr. of gravel (SC)		3-2-WH	
20.00	Wet, lt. brown gray, silty SAND w/gravel (SM)		5-5-4-8	20
	BOTTOM OF HOLE			

* {Contains organic material}

Depth of water 3.5' @ start of boring.

DH-11
GROUNDWATER DATA
WHILE DRILLING: NT
ON COMPLETION: NT
24 Hr. READING: NT

Fill Auger SPT RB
Cored 300 lb Tubex Hand
Fish Tail Vibra Core Water Jet Odex

GEO-2 KINGMAN LAKE PROJECT.GPJ 3/7/06 14:04

VI. AL-MANUAL CLASSIFICAT. N

(Test method: ASTM D 2488)

PROJECT: Kingman Island **DATE:** Feb 2006

AREA: Anacostia River **CLASSIFIED BY:** Estes

Washington, DC

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
DH-1			
Jar -1	0.0-1.5	slightly moist dk gry brn silty sand ① w/ gravel	(SM)
-2	1.5-3.0	ditto ①	(SM)
-3	3.0-4.5	moist dk brn ditto ①	(SM)
small sample -4	4.5-6.0	slightly moist dk gry brn ditto	(SM)
small sample -5	6.0-7.5	moist dk gry brn clayey sand + trace of gravel	(SC)
-6	7.5-9.0	moist yel brn lean clay w/ sand	(CL)
-7	9.0-10.5	moist dk gry brn ditto	(CL)
-8	10.5-12.0	moist brn ditto	(CL)
		① contains glass fragments	
DH-2			
Jar -1	0.0-1.5	slightly moist dk gry brn silty sand ① w/ gravel	(SM)
-2	1.5-3.0	moist very dk gry brn clayey sand ①② w/ gravel	(SC)
small sample -3	3.0-4.5	moist dk brn ditto ①②	(SC)
-4	4.5-6.0	moist brn sandy lean clay ② + trace of gravel	(CL)
very small sample -5	6.0-7.5	moist dk yel brn clayey sand ② w/ gravel	(SC)
-6	7.5-9.0	moist yel brn lean clay w/ sand	(CL)
-7	9.0-10.5	ditto	(CL)
-8	10.5-12.0	moist gry brn ditto	(CL)
		① contains glass fragments	
		② contains red brick fragments	

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Kingman Island **DATE:** Feb 2006

AREA: Anacostia River **CLASSIFIED BY:** Estes

Washington, DC

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
DH-3			
Jar -1	0.0-1.5	moist very dk gry brn silty sand ① w/ gravel	(SM)
-2	1.5-3.0	ditto ①	(SM)
-3	3.0-4.5	moist dk gry brn lean clay w/ sand trace of gravel	(CL)
-4	4.5-6.0	ditto	(CL)
-5	6.0-7.5	moist gry brn lean clay w/ sand	(CL)
-6	7.5-9.0	ditto	(CL)
-7	9.0-10.5	ditto	(CL)
-8	10.5-12.0	ditto	(CL)
		① contains glass fragments	
DH-4			
very small Jar sample -1	0.0-1.5	very moist brn lean clay w/ sand	(CL)
-2	1.5-3.0	wet gry brn fat clay w/ sand	(CH)
small sample -3	3.0-4.5	ditto	(CH)
small sample -4	4.5-6.0	ditto	(CH)
-5	6.0-7.5	wet dk gry ditto	(CH)
-6	7.5-9.0	very moist gry brn fat clay trace of sand	(CH)
-7	9.0-10.5	ditto	(CH)
-8	10.5-12.0	ditto	(CH)
-9	12.0-13.5	very moist dk gry brn lean to fat clay trace of sand	CL/CH
-10	13.5-15.0	ditto	CL/CH
-11	15.0-16.5	moist very dk gry brn fat clay trace of sand and roots	(CH)
-12	16.5-18.0	moist gry brn sandy lean clay	CL/SC
-13	18.0-20.0	wet gry brn silty sand ①	(SM)
		① fine sand	

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Kingman Island **DATE:** Feb 2006

AREA: Anacostia River **CLASSIFIED BY:** Estes

Washington, DC

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
DH-5			
Small Jar Sample-1	0.0-1.5	wet yelbrn lean clay w/sand	(CL)
Small Sample-2	1.5-3.0	moist dk grybrn fat clay trace of sand	(CH)
-3	3.0-4.5	wet grybrn ditto	(CH)
-4	4.5-6.0	wet dk grybrn ditto	(CH)
-5	6.0-7.5	ditto	(CH)
-6	7.5-9.0	wet dk gry ditto	(CH)
-7	9.0-10.5	wet dk grybrn ditto	(CH)
-8	10.5-12.0	ditto	(CH)
-9	12.0-13.5	moist very dk grybrn ditto①	(CH)
-10	13.5-15.0	ditto①	(CH)
-11	15.0-16.5	very moist grybrn lean clay w/sand	(CL)
-12	16.5-18.0	wet grybrn silty sand②	(SM)
-13	18.0-20.0	ditto②	(SM)
		① contains organic material	
		② fine sand	
DH-6			
Jar -1	0.0-1.5	moist brn clayey sand w/gravel trace of roots	(SC)
-2	1.5-3.0	slightly moist lt gry silty sand w/gravel	(SM)
-3	3.0-4.5	slightly moist very pale brn ditto	(SM)
-4	4.5-6.0	moist yelbrn poorly graded sand w/silt and gravel	SP-SM/SM
-5	6.0-7.5	moist dk yelbrn clayey sand w/gravel	(SC)
-6	7.5-9.0	moist yelbrn ditto	(SC)
-7	9.0-10.5	moist yelbrn sandy lean clay w/gravel	CL/SC
-8	10.5-12.0	ditto	(CL)

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Kingman Island **DATE:** Feb 2006

AREA: Anacostia River **CLASSIFIED BY:** Estes

Washington, DC

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
DH-7			
Jar -1	0.0-1.5	moist yel brn clayey sand w/gravel trace of roots	(SC)
Small Sample -2	1.5-2.0	slightly moist yel brn clayey sand w/gravel	(SC)
-3	3.0-4.5	moist yel brn silty sand w/gravel	(SM)
-4	4.5-6.0	ditto	(SM)
-5	6.0-7.5	moist stf brn sandy lean clay trace of gravel	(CL)
-6	7.5-9.0	moist dK yel brn clayey sand w/gravel	(SC)
-7	9.0-10.5	moist ditto	SC/CL
-8	10.5-12.0	moist gry brn sandy lean clay trace of gravel	(CL)
DH-8			
Jar -1	0.0-1.5	slightly moist yel brn clayey sand w/gravel trace of roots	(SC)
-2	1.5-3.0	moist dK yel brn clayey sand w/gravel	(SC)
-3	3.0-4.5	moist dK yel brn sandy lean clay trace of gravel and roots	(CL)
-4	4.5-6.0	moist dK yel brn clayey sand w/gravel	(SC)
-5	6.0-7.5	moist gry brn clayey sand w/gravel	(SC)
-6	7.5-9.0	moist yel brn silty sand w/gravel	(SM)
-7	9.0-10.5	moist dK gry brn clayey sand w/gravel	(SC)
-8	10.5-12.0	very moist gry brn ditto	(SC)

VI. AL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Kingman Island **DATE:** Feb 2006

AREA: Anacostia River **CLASSIFIED BY:** Estes

Washington, DC

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
DH-9			
Jar -1	0.0-1.5	moist str brn clayey sand w/gravel	(SC)
-2	1.5-3.0	moist dK yel brn sandy lean clay trace of gravel	(CL)
-3	3.0-4.5	moist dK yel brn silty sand[1] w/gravel	(SM)
-4	4.5-6.0	moist gry brn clayey sand[2] w/gravel	(SC)
-5	6.0-7.5	moist gry brn to yel brn clayey sand[3] w/gravel	SC/CL
-6	7.5-9.0	moist gry brn ditto[3]	(SC)
Small Sample -7	9.0-10.5	moist yel brn ditto[3]	(SC)
-8	10.5-12.0	wet dK gry brn ditto	(SC)
		[1] sample is mostly organic material	
		[2] contains organic material and red brick fragments	
		[3] contains organic material	
DH-10			
Very Small Jar Sample 1	0.0-1.5	dry pale brn silty sand w/gravel trace of roots	(SM)
-2	1.5-3.0	moist very dK gry brn elastic silt[1] w/sand	(MH)
-3	3.0-4.5	moist dK gry brn fat clay trace of sand	(CH)
Small Sample -4	4.5-6.0	ditto	(CH)
Small Sample 5	6.0-7.5	ditto	(CH)
-6	7.5-9.0	No Sample	—
-7	9.0-10.5	wet very dK gry brn elastic silt[1] w/sand	(MH)
-8	10.5-12.0	ditto[1]	(MH)
-9	12.0-13.5	very moist dK gry brn fat clay trace of sand	(CH)
-10	13.5-15.0	ditto	(CH)
-11	15.0-16.5	ditto	(CH)
Small Sample -12	16.5-18.0	ditto	(CH)
-13	18.0-20.0	wet dK gry brn sandy lean clay trace of gravel	(CL)
		[1] contains organic material	

VISUAL-MANUAL CLASSIFICATION

(Test method: ASTM D 2488)

PROJECT: Kingman Island **DATE:** Feb 2006

AREA: Anacostia River **CLASSIFIED BY:** Estes

Washington, DC

SAMPLE NO.	DEPTH (ft)	VISUAL CLASSIFICATION	SYMBOL
DH-11			
Small Jar Sample 1	0.0-1.5	wet dk gry lean clay w/sand	(CL)
-2	1.5-3.0	wet gry brn fat clay trace of sand	(CH)
-3	3.0-4.5	ditto	(CH)
-4	4.5-6.0	ditto	(CH)
-5	6.0-7.5	wet dk gry brn ditto	(CH)
-6	7.5-9.0	very moist ditto	(CH)
-7	9.0-10.5	ditto	(CH)
-8	10.5-12.0	ditto①	(CH)
-9	12.0-13.5	wet very dk gry brn ditto①	(CH)
-10	13.5-15.0	wet very dk gry brn elastic silt① w/sand	(MH)
-11	15.0-16.5	ditto①	(MH)
-12	16.5-18.0	wet gry brn clayey sand trace of gravel	(SC)
-13	18.0-20.0	wet lt brn gry silty sand w/gravel	(SM)
		① contains organic material	

No. DH - 1

DRILLING LOG

DIVISION: NAD

INSTALLATION: Baltimore District

SHEET 1 OF 1 SHEETS

1. PROJECT: Kingman Lake
2. LOCATION (Coordinates or Station): Washington, DC
3. DRILLING AGENCY: CENAB-EN-GGE
4. HOLE NO. (As shown on drawing title and file number): DH - 1
5. NAME OF DRILLER: ~~Albert Hohmann~~/John Blackson
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED DEG. FROM VERTICAL
7. THICKNESS OF OVERBURDEN: 12.0'
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 12.0'
10. SIZE AND TYPE OF BIT: 2 1/4 HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): ~
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8 UNDISTURBED —
14. TOTAL NO. OF CORE BOXes: —
15. ELEVATION OF GROUND WATER: See Remarks
16. DATE HOLE: STARTED 18 - AUG - 05 COMPLETED 18 - AUG - 05
17. ELEVATION TOP OF HOLE: ~
18. TOTAL CORE RECOVERY FOR BORING: ~ %
19. SIGNATURE OF INSPECTOR: W Sigler

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		GRAVELLY SAND, MEDIUM TO COARSE, DRY, SOFT, TR GLASS, COARSE, TR SILT, TR ROOTS, COARSE, DULL DARK BROWN TO BLACK.	100%	J-1	Boring was drilled using 2 1/4" Hollow Stem Augers. Sampled using a standard 1 3/8" split spoon driven automatically by a 140 lb. hammer dropped 30". Hole was backfilled after the 24 hour water reading.
	2.0		GRAVELLY SAND, MEDIUM TO COARSE, DRY, SOFT, TR GLASS, COARSE, TR SILT, TR ROOTS, COARSE, DULL DARK BROWN TO BLACK.	100%	J-2	
	4.0		GRAVELLY, SAND, MEDIUM TO COARSE, DRY, SOFT, TR GLASS, COARSE, TR SILT, DULL DARK BRN TO BLACK. 4.4. SILTY SAND, FINE, DAMP, SOFT, WITH SOME CLAY, DARK GRAYISH BROWN	67%	J-3	
	6.0		SILTY SAND, FINE, DAMP, SOFT, WITH SOME CLAY, DARK GRAYISH BROWN.	13%	J-4	Blow Penetro- Jar # Depth Count meter J-1 0.0-1.5 5,9,12 NA J-2 1.5-3.0 12,15,26 NA J-3 3.0-4.5 18,12,7 NA J-4 4.5-6.0 1,2,2 NA J-5 6.0-7.5 1,WOH,WOH NA J-6 7.5-9.0 1,2,WOH, <1.5,<1.5 J-7 9.0-10.5 WOH,WOH,WOH,<1.5,<1.5,<1.5 J-8 10.5-12.0 WOH,WOH,WOH <1.5,<1.5,<1.5
	8.0		SILTY SAND, FINE, DAMP, SOFT, WITH SOME CLAY, TR COARSE SAND, TR BRICK DEBRIS COARSE DARK BROWN TO BLACK.	13%	J-5	
			SILTY CLAY, DAMP, SOFT, TR BRICK DEBRIS COARSE, TR ORGANICS COARSE DARK BROWN	100%	J-6	
	10.0		SILTY CLAY DAMP, SOFT, TR ORGANICS COARSE DARK GRAY.	14%	J-7	
			SILTY CLAY, DAMP, SOFT TR ORGANICS COARSE, DARK GRAY.	67%	J-8	
	12.0		END OF HOLE 12.0'			
	14.0					
	16.0					Goundwater Readings Encountered: NOT ENC Completion : DRY 24 Hours : DRY
	18.0					PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL
	20.0					

H. No. DH - 3

DRILLING LOG

DIVISION: NAD

INSTALLATION: Baltimore District

SHEET 1 OF 1 SHEETS

1. PROJECT: Kingman Lake
2. LOCATION (Coordinates or Station): Washington, DC
3. DRILLING AGENCY: CENAB-EN-GGE
4. HOLE NO. (As shown on drawing title and file number): DH - 3
5. NAME OF DRILLER: ~~Albert Nawrocki~~ John Blackson
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED DEG. FROM VERTICAL
7. THICKNESS OF OVERBURDEN: 12.0
8. DEPTH DRILLED INTO ROCK: —
9. TOTAL DEPTH OF HOLE: 12.0
10. SIZE AND TYPE OF BIT: 2¼ HSA
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): ~
12. MANUFACTURER'S DESIGNATION OF DRILL: CME 45
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 8 UNDISTURBED
14. TOTAL NO. OF CORE BOXes: —
15. ELEVATION OF GROUND WATER: See Remarks
16. DATE HOLE: STARTED 18 - AUG - 05 COMPLETED 18 - AUG - 05
17. ELEVATION TOP OF HOLE: ~
18. TOTAL CORE RECOVERY FOR BORING: ~ %
19. SIGNATURE OF INSPECTOR: WS Bayly

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		GRAVELLY SAND, MEDIUM TO COARSE, TR BLDG MATERIAL, COARSE DRY SOFT, DARK BROWN TO BLACK	80%	J-1	Boring was drilled using 2¼" Hollow Stem Augers. Sampled using a standard 1 3/8" split spoon driven automatically by a 140 lb. hammer dropped 30". Hole was backfilled after the 24 hour water reading.
	2.0		GRAVELLY SAND, MEDIUM TO COARSE, TR BLDG MATERIAL COARSE. DRY SOFT, DARK BROWN TO BLACK.	100%	J-2	
	4.0		GRAVELLY SAND MEDIUM TO COARSE TR BLDG MATERIAL COARSE DRY SOFT, DARK BROWN TO BLACK 3.7- SILTY CLAY, DAMP, SOFT, TR SAND MEDIUM TO GRAVEL, MEDIUM GRAY.	87%	J-3	
	6.0		SILTY CLAY, DAMP, SOFT, TR BLDG DEBRIS COARSE. DULL BROWNISH GRAY.	100%	J-4	
	8.0		SILTY CLAY, DAMP, SOFT, TR BLDG DEBRIS COARSE; DULL BROWNISH GRAY	100%	J-5	
	10.0		SILTY CLAY, DAMP, SOFT, DULL BROWNISH GRAY.	100%	J-6	
	12.0		SILTY CLAY, DAMP SOFT, TR DEBRIS (CARBONIZED WOOD) COARSE. DULL BROWNISH GRAY.	100%	J-7	
	14.0		END OF HOLE 12.0'		J-8	
	16.0					
	18.0					
	20.0					

Jar #	Depth	Blow Count	Penetrometer
J-1	0.0-1.5	4,44	NA
J-2	1.5-3.0	15,8,7	NA
J-3	3.0-4.5	2,1,2	NA, 1.0, 1.0
J-4	4.5-6.0	1,1,2	1.0, 1.0, 1.0
J-5	6.0-7.5	1,1,1	1.0, 0.5
J-6	7.5-9.0	WOH,1	<.5, <.5
J-7	9.0-10.5	WOH, WOH, WOH	<.5, <.5
J-8	10.5-12.0	WOH, WOH, WOH	<.5, 0.5

Goundwater Readings

Encountered: NOT ENC
Completion : DRY
24 Hours : DRY

PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL

Hole No. DH - 5

DRILLING LOG	DIVISION NAD	INSTALLATION Baltimore District	SHEET 1 OF 1 SHEETS
1. PROJECT Kingman Lake		10. SIZE AND TYPE OF BIT 1 3/8" Spl. Spoon, 4" CASING	
2. LOCATION (Coordinates or Station) Washington, DC		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) ~	
3. DRILLING AGENCY CENAB-EN-GGE		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE, Mobile CATHEAD	
4. HOLE NO. (As shown on drawing title and file number) DH - 5		13. TOTAL NO. OF OVER-BURDEN SAMPLS TAKEN: DISTURBED 13 JARS	UNDISTURBED —
5. NAME OF DRILLER Albert McNamara/John Blackson		14. TOTAL NO. OF CORE BOXes	15. ELEVATION OF GROUND WATER See Remarks
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL	16. DATE HOLE STARTED 23 - AUG - 05	COMPLETED 23 - AUG - 05
7. THICKNESS OF OVERBURDEN 20.0		17. ELEVATION TOP OF HOLE ~	
8. DEPTH DRILLED INTO ROCK 20.0		18. TOTAL CORE RECOVERY FOR BORING ~	%
9. TOTAL DEPTH OF HOLE 20.0		19. SIGNATURE OF INSPECTOR C. KNETEN	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		0.0-1.5 J-1 WET: Black, Silty CLAY w/ LEAVE FRAGS SEDIMENT Blows: WOR/WOR/WOR	0.3	J-1	Boring was drilled using 4" casing washed with water from jigger pump. Sampled using a standard 1 3/8" split spoon driven manually by a 140 lb. hammer dropped 30". No water readings obtained.
	2.0		1.5-3.0 J-2 WET, Black Silty CLAY. SEDIMENT Blows: WOR/WOR/WOR	0.2	J-2	
	4.0		3.0-4.5 J-3 Blows: WOR/WOR/WOR "	0.6	J-3	
			4.5-6.0 J-4 Blows: WOR/WOR/WOR "	1.1	J-4	
	6.0		6.0-7.5 J-5 Blows: WOR/WOR/WOR "	1.0	J-5	
	8.0		7.5-9.0 J-6 Blows: WOR/WOR/WOR "	1.2	J-6	
	10.0		9.0-10.5 J-7 WET- BROWN Silty CLAY Sediment Blows: WOR/WOR/WOR	1.3	J-7	
			10.5-12.0 J-8 WET- Black Silty CLAY Sediment Blows: WOR/WOH/WOH	1.5	J-8	
	12.0		12.0-13.5 J-9 WET-Black Silty CLAY w/ Wood FRAG Sediment Blows: WOH/WOH/WOH	1.5	J-9	
	14.0		13.5-15.0 J-10 " Blows: WOH/WOH/1	1.5	J-10	
	16.0		15.0-16.5 J-11 WET- GRAY SANDY Silt Blows: WOH/WOH/1	1.5	J-11	
			16.5-18.0 J-12 " Blows: 2-1-3	1.3	J-12	
	18.0		18.0-20.0 J-13 Blows: 4-3-4-1 "	1.5	J-13	
	20.0		BOH @ 20.0			

Blow Penetro-

Jar #	Depth	Count	meter
J-1	0.0-1.5	WOR/WOR/WOR	
J-2	1.5-3.0	"	"
J-3	3.0-4.5	"	"
J-4	4.5-6.0	"	"
J-5	6.0-7.5	"	"
J-6	7.5-9.0	"	"
J-7	9.0-10.5	"	"
J-8	10.5-12.0	WOR/WOH/WOH	
J-9	12.0-13.5	WOH/WOH/WOH	
J-10	13.5-15.0	WOH/WOH/1	
J-11	15.0-16.5	WOH/WOH/1	
J-12	16.5-18.0	2-1-3	
J-13	18.0-20.0	4-3-4-1	

BOH @ 20.0

PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL

Hole No. DH - 7

DRILLING LOG	DIVISION: NAD	INSTALLATION: Baltimore District	SHEET 1 OF 1 SHEETS
1. PROJECT: Kingman Lake		10. SIZE AND TYPE OF BIT: 2 1/4" HSA	
2. LOCATION (Coordinates or Station): Washington, DC		11. DATUM FOR ELEVATION SHOWN (TBM or MSL): ~	
3. DRILLING AGENCY: CENAB-EN-GGE		12. MANUFACTURER'S DESIGNATION OF DRILL: CME 45	
4. HOLE NO. (As shown on drawing title and file number): DH - 7		13. TOTAL NO. OF OVER-BURDEN SAMPLS TAKEN: DISTURBED 8	UNDISTURBED —
5. NAME OF DRILLER: Albert McLaughlin/John Blackson		14. TOTAL NO. OF CORE BOXes: —	15. ELEVATION OF GROUND WATER: See Remarks
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED DEG. FROM VERTICAL		16. DATE HOLE: STARTED 18 - AUG - 05	COMPLETED 19 - AUG - 05
7. THICKNESS OF OVERBURDEN: 12.0'		17. ELEVATION TOP OF HOLE: ~	
8. DEPTH DRILLED INTO ROCK: —		18. TOTAL CORE RECOVERY FOR BORING: ~ %	
9. TOTAL DEPTH OF HOLE: 12.0		19. SIGNATURE OF INSPECTOR:	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		GRAVELLY SAND, DRY, SILT TO HARD, MEDIUM TR ROOTS. TR BLDG DEBRIS COARSE MEDIUM BROWN.	100%	J-1	Boring was drilled using 2¼ Hollow Stem Augers. Sampled using a standard 1 3/8" split spoon driven automatically by a 140 lb. hammer dropped 30". Hole was backfilled after the 24 hour water reading.
	2.0		GRAVELLY SAND, DRY, SILT TO HARD MEDIUM TR ROOTS TR BLDG DEBRIS COARSE MEDIUM BROWN	100%	J-2	
	4.0		SANDY GRAVEL, DRY, HARD, TR SILT, DULL BROWN.	100%	J-3	
			SANDY GRAVEL DAMP, HARD TR SILT, DULL BROWN.	100%	J-4	
	6.0		SANDY GRAVEL DAMP, HARD. TR SILT. WEAKLY MOTTLED. DULL BROWNS.	100%	J-5	
	8.0		GRAVELLY SAND, DAMP, SOFT, TR SILT, MEDIUM BROWN.	67%	J-6	
	10.0		GRAVELLY SAND DAMP, SOFT TR SILT, TR CLAY, MEDIUM BROWN.	67%	J-7	
			SILTY CLAY, DAMP, SOFT, MEDIUM GRAYISH BROWN.	67%	J-8	
	12.0		END OF HOLE 12.0'			
	14.0					
	16.0					
	18.0					
	20.0					

Jar #	Depth	Blow Count	Penetrometer
J-1	0.0-1.5	4,16,16	NA
J-2	1.5-2.0	40,50/0	NA
J-3	3.0-4.5	13,24,30	NA
J-4	4.5-6.0	17,15,16	NA
J-5	6.0-7.5	10,14,14	NA
J-6	7.5-9.0	11,6,6	NA
J-7	9.0-10.5	2,2,3	NA
J-8	10.5-12.0	1,1,1	1.0, 1.0, 1.5

Goundwater Readings

Encountered: NOT ENC
Completion : DRY
24 Hours : DRY

PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL

Hole No. DH - 9

DRILLING LOG	DIVISION NAD	INSTALLATION Baltimore District	SHEET 1 OF 1 SHEETS

1. PROJECT Kingman Lake	10. SIZE AND TYPE OF BIT 2¼ HSA
2. LOCATION (Coordinates or Station) Washington, DC	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) ~
3. DRILLING AGENCY CENAB-EN-GGE	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45
4. HOLE NO. (As shown on drawing title and file number) DH - 9	13. TOTAL NO. OF OVER-BURDEN SAMPLS TAKEN DISTURBED 8 UNDISTURBED
5. NAME OF DRILLER ~~Albert McNamara~~/John Blackson	14. TOTAL NO. OF CORE BOXes — 15. ELEVATION OF GROUND WATER See Remarks
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED DEG. FROM VERTICAL	16. DATE HOLE STARTED 19 - AUG - 05 COMPLETED 19 - AUG - 05
7. THICKNESS OF OVERBURDEN 12.0'	17. ELEVATION TOP OF HOLE ~
8. DEPTH DRILLED INTO ROCK —	18. TOTAL CORE RECOVERY FOR BORING ~ %
9. TOTAL DEPTH OF HOLE 12.0'	19. SIGNATURE OF INSPECTOR W E Sykes

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		GRAVELLY SAND, MEDIUM SOFT, DAMP, TR SILT, TR CLAY DULL ORANGISH BROWN	100%	J-1	**Boring was drilled using 2¼ Hollow Stem Augers. Sampled using a standard 1 3/8" split spoon driven automatically by a 140 lb. hammer dropped 30". Hole was backfilled after the 24 hour water reading.**
	2.0		GRAVELLY SAND, MEDIUM, SOFT, DAMP, A LITTLE CLAY, TR SILT, DULL ORANGISH BROWN	67%	J-2	
	4.0		GRAVELLY SAND, MEDIUM, SOFT DAMP, TR SILT TR CLAY CHANGED PLYWOOD COARSE, DULL ORANGISH BROWN TO BLACK.	67%	J-3	
			GRAVELLY SAND, DRY, SOFT, TO HARD, BLDG DEBRIS COARSE. BRICK RED TO BROWNS TO GRAY	100%	J-4	
	6.0		GRAVELLY SAND DRY SOFT TO HARD, BLDG DEBRIS COARSE. BROWNS TO GRAYS	80%	J-5	**Blow Penetro-** **Jar # Depth Count meter** J-1 0.0-1.5 3,8,11 NA J-2 1.5-3.0 3,5,5 NA J-3 3.0-4.5 4,15,K NA J-4 4.5-6.0 3,23,26 NA J-5 6.0-7.5 16,15,7 NA J-6 7.5-9.0 3,5,11 NA J-7 9.0-10.5 10,9,5 NA J-8 10.5-12.0 7,6,5 NA
	8.0		GRAVELLY SAND, DRY, SOFT TO HARD, BLDG DEBRIS COARSE BROWN TO GRAY	73%	J-6	
			GRAVELLY SAND DRY TO WET, SOFT TO HARD, BLDG DEBRIS COARSE, BROWN TO GRAY. BWE 10.0'	60%	J-7	
	10.0		GRAVELLY SAND, WET, SOFT, DARK GRAY	80%	J-8	
	12.0		END OF HOLE 12.0'			**Goundwater Readings** **Encountered: 10.0'** **Completion : 10.0'** **24 Hours :**
	14.0					**PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL**
	16.0					
	18.0					
	20.0					

...ole No. DH - 11

DRILLING LOG	DIVISION NAD	INSTALLATION Baltimore District	SHEET 1 OF 1 SHEETS
1. PROJECT Kingman Lake		10. SIZE AND TYPE OF BIT 1 3/8" SPLIT SPOON 4" CASING	
2. LOCATION (Coordinates or Station) Washington, DC		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) ~	
3. DRILLING AGENCY CENAB-EN-GGE		12. MANUFACTURER'S DESIGNATION OF DRILL BARGE, Mobile CATHEAD	
4. HOLE NO. (As shown on drawing title and file number) DH - 11		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 13 JARS	UNDISTURBED —
5. NAME OF DRILLER Albert McNamara/John Blackson		14. TOTAL NO. OF CORE BOXes —	15. ELEVATION OF GROUND WATER See Remarks
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL	16. DATE HOLE STARTED 23 - AUG - 05	COMPLETED 23 - AUG - 05
7. THICKNESS OF OVERBURDEN 20.0		17. ELEVATION TOP OF HOLE ~	
8. DEPTH DRILLED INTO ROCK 20.0		18. TOTAL CORE RECOVERY FOR BORING	%
9. TOTAL DEPTH OF HOLE 20.0		19. SIGNATURE OF INSPECTOR C. KNETEN	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.0		0.0-1.5 J-1 WET, BLACK silty Sediment w/ LEAVE FRAGS Blows: WOR/WOR/WOR	0.3	J-1	Boring was drilled using 4" casing washed with water from jigger pump. Sampled using a standard 1 3/8" split spoon driven manually by a 140 lb. hammer dropped 30". No water readings obtained.
	2.0		1.5-3.0 J-2 WET, BLACK silty CLAY Sediment Blows: WOR/WOR/WOR	0.6	J-2	
			3.0-4.5 J-3 " Blows: WOR/WOR/WOR	0.9	J-3	
	4.0		4.5-6.0 J-4 " Blows: WOR/WOR/WOR	1.2	J-4	
	6.0		6.0-7.5 J-5 " w/ LEAVE FRAGS Blows: WOR/WOR/WOH	0.8	J-5	Blow Penetro- Jar # Depth Count meter J-1 0.0-1.5, WOR/WOR/WOR J-2 1.5-3.0 " " " J-3 3.0-4.5 " " "
	8.0		7.5-9.0 J-6 WET, BLACK, silty CLAY Sediment Blows: WOR/WOH/WOH	1.5	J-6	J-4 4.5-6.0 " " " J-5 6.0-7.5, WOR/WOR/WOH J-6 7.5-9.0, WOR/WOH/WOH
			9.0-10.5 J-7 " Blows: WOR/WOH/WOH	1.0	J-7	J-7 9.0-10.5, WOR/WOH/WOH J-8 10.5-12.0 WOH/WOH/WOH J-9 12.0-13.5 " " "
	10.0		10.5-12.0 J-8 WET, BLACK, silty CLAY w/ wood FRAGS Sediment Blows: WOH/WOH/WOH	1.1	J-8	J-10 13.5-15.0 " " " J-11 15.0-16.5, WOR/WOH/WOH J-12 16.5-18.0, 3-2-WOH J-13 18.0-20.0, 5-5-4-8 BOH @ 20.0
	12.0		12.0-13.5 J-9 " Blows: WOH/WOH/WOH	1.0	J-9	
			13.5-15.0 J-10 " Blows: WOH/WOH/WOH	1.5	J-10	PRELIMINARY INSPECTOR'S LOG CLASSIFICATION NOT FINAL
	14.0		15.0-16.5 J-11 " Blows: WOR/WOH/WOH	1.5	J-11	
	16.0		16.5-18.0 J-12 WET DARK BROWN Silty SANDY CLAY Blows: 3-2-WOH	1.5	J-12	
	18.0		18.0-20.0 J-13 WET BROWN TAN SANDY SILT w/ GRAVEL Blows: 5-5-4-8	1.5	J-13	
	20.0		BOH @ 20.0			