Lake Washington Apartments Phase II Follow-up Groundwater Characterization

Technical Report

Prepared for
Bayside Washington, LLC
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September 13, 2012

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Background

On July 23, Bayside Washington, LLC received an opinion letter from the Washington State Department of Ecology (Ecology) addressing the May 16, 2012 Site Characterization report documenting an independent cleanup at the Lake Washington Apartments site. Site characterization at the time of tank removal in 1997 indicated that most heating oil-contaminated soil had been removed, with small amounts left beneath some buildings; because groundwater was not evident at the time, no groundwater characterization was performed. A groundwater investigation was conducted in spring of 2012 to determine whether contaminated groundwater might be found adjacent to Building 35 as a result of residual soil contamination beneath the building (Figure 1). This investigation provided a detailed examination of a shallow clay layer across the site and interpretation of perched water conditions near the building. Review of the report resulted in an opinion stating that a determination of further cleanup is contingent on additional characterization of groundwater at the site, particularly addressing conditions near Buildings 2, 5, and 35. A phone conversation between Peter Jowise of Herrera and Eugene Freeman of Ecology on July 26 resulted in an agreement that conditions at Building 35 had been adequately characterized and that further sampling at Buildings 2 and 5 was warranted.

Herrera returned to the site on August 9 to advance borings at buildings 2 and 5; however, a mix up resulted in borings advanced at Buildings 2 and 12. Herrera then returned to the site on August 31 to address conditions at Building 5. At each location, an initial boring was advanced into the former tank excavation backfill (Figure 1). Probes were advanced until groundwater was encountered such that a sample could be collected. Because groundwater was encountered in the first boring at each former tank location, two additional borings also were advanced approximately 20 feet to the east and west to determine whether groundwater appeared to extend laterally in a consistent manner or appeared to consist of potentially independent perched zones, as found at Building 35. If heating oil was identified as present in groundwater collected from the first boring, groundwater from the other two borings were to be analyzed.

Sampling and analytical procedures were conducted according to those documented in the May 16th Site Characterization report. Three borings were advanced at each of Buildings 2, 5, and 12. Groundwater was sampled from all three borings at Building 2 (LKWA-11, LKWA-12, LKWA-13), three borings at Building 5 (LKWA-17, LKWA-18, LKWA-19), and two borings at Building 12 (LKWA-14, LKWA-16); no groundwater was encountered in LKWA-15 to a depth of 28.5 feet, where the probe met refusal due to cobbles. Samples were analyzed at each location, except LKWA-18 and -19, where no heating oil was detected in initial sample LKWA-17.

Results

Subsurface Conditions

Two of the three borings at each building were advanced through former tank excavation backfill that ranged from 8 to 14.5 feet thick. The third boring at each building found fill associated with site grading that ranged from 4.5 to 6 feet thick. Groundwater was sampled at each location from backfill, except at two locations where it was collected from the backfill-peat layer interface (LKWA-12 at Building 2 and LKWA-14 at Building 12) and one location where it was collected from a 23 foot deep sand layer situated beneath a clay layer beneath a peat layer (LKWA-18 at Building 5). Groundwater at LKWA-18 was under pressure, rising to just below the ground surface after setting the screen between 21 to 25 feet deep. A summary of near-surface soil and groundwater conditions is provided in Table 1.

Table 1. Near-surface soil and groundwater conditions.

Boring	Fill Thickness (ft)	Screened interval (ft)	Static Water Level Position in Fill	Boring Within Tank Excavation	Saturated Zone Description
Building 2					
LKWA-11	8.5	3 – 8	mid	Y	Gravelly sand
LKWA-12	7.5	9.5 – 14.5	bottom	N	Peat, silty clay, sand
LKWA-13	8.5	4 – 9	mid	Y	Gravelly sand
Building 12					
LKWA-14	10.5	8.5 – 13.5	bottom	Y	Gravelly sand, gravelly clayey sand, peat
LKWA-15	10.5	–	–	Y	–
LKWA-16	6	3 – 8	mid	N	Silty gravelly sand, peat
Building 5					
LKWA-17	14.5	2 – 7	mid	Y	Silty sandy gravel
LKWA-18	6	21 – 25	top*	N	Silty clay, silty sand, silty clay
LKWA-19	8	3 – 8	mid	Y	Sandy gravel

– Groundwater not found.

* Groundwater under pressure between clay layers.

Detailed descriptions of soil sequences and subsurface conditions are provided in boring logs in Attachment 1.

Analytical Data

A data review was performed for chemical data collected for this project; both the laboratory data reports and a data quality summary are provided in Attachment 2. Chemistry data met criteria associated with the method used and are considered acceptable for use; no data were qualified or rejected.

Groundwater sample analytical results are summarized in Table 2. Diesel-range or lube oil-range hydrocarbons were found at concentrations below the Model Toxics Control Act (MTCA) method A cleanup level at LKWA-11 (Building 2) and LKWA-14 (Building 12); no petroleum hydrocarbons were detected in any other sample.

Table 2. Groundwater sampling results, Lake Washington Apartments Phase II follow up groundwater assessment, Seattle, Washington.

	Diesel-range Petroleum Hydrocarbons	Lube-oil Range Petroleum Hydrocarbons
MTCA method A Cleanup Level (µg/L)	500	500
LKWA-11	**330**	410 U
LKWA-12	310 U	470 U
LKWA-13	260 U	410 U
LKWA-14	260 U	**440**
LKWA-16	220 U	360 U
LKWA-17	260 U	410 U

a Method A soil cleanup level for unrestricted land use (Ecology 2007).
µg/L microgram per liter
U The analyte was not detected above the associated reporting limit
Bold values indicate a result above the laboratory reporting limit

Findings and Conclusions

Three push probes were installed at each of three building locations to determine if groundwater was present and, if present, whether it was contaminated by residual heating oil associated with historical buried tanks removed in 1997. Groundwater was found at each building location, but samples indicated no concentrations exceeding MTCA method A cleanup levels. Groundwater was found at all borehole locations, except one. Boreholes were installed at each building at the center of the former tank locations and approximately 20 feet to both the east and west. At each building, two of the borings were situated within the former tank excavation backfill and one boring was located beyond the former tank excavation footprint. Depth to groundwater ranged between:

- 3.5 – 7.8 feet at Building 2
- 4.4 – 9.9 feet at Building 12
- 3.6 – 23 feet at Building 5.

These highly variable conditions across a total of 40 lateral feet at each building are consistent with those observed at Building 35, indicating that shallow groundwater does not exist as a continuously distributed water body that flows in a consistent direction. Shallow water appears to be trapped near the surface, with no offsite flow path. One groundwater sample collected at Building 35 exhibited diesel-range petroleum hydrocarbons of 1,200 ug/L, exceeding the MTCA method A cleanup level of 500 ug/L, two of the other nine samples collected at the four buildings detected diesel- or lube oil-range petroleum hydrocarbons above the reporting laboratory limit and no petroleum hydrocarbons were detected at the other seven locations. Residual heating oil appears to exist in soil beneath some buildings, but there is no evidence of significant impact on groundwater at the four locations tested. Also, based on the sporadic depth to groundwater at each building, groundwater does not appear to flow offsite. Based on these site conditions, we request no further action at this site.

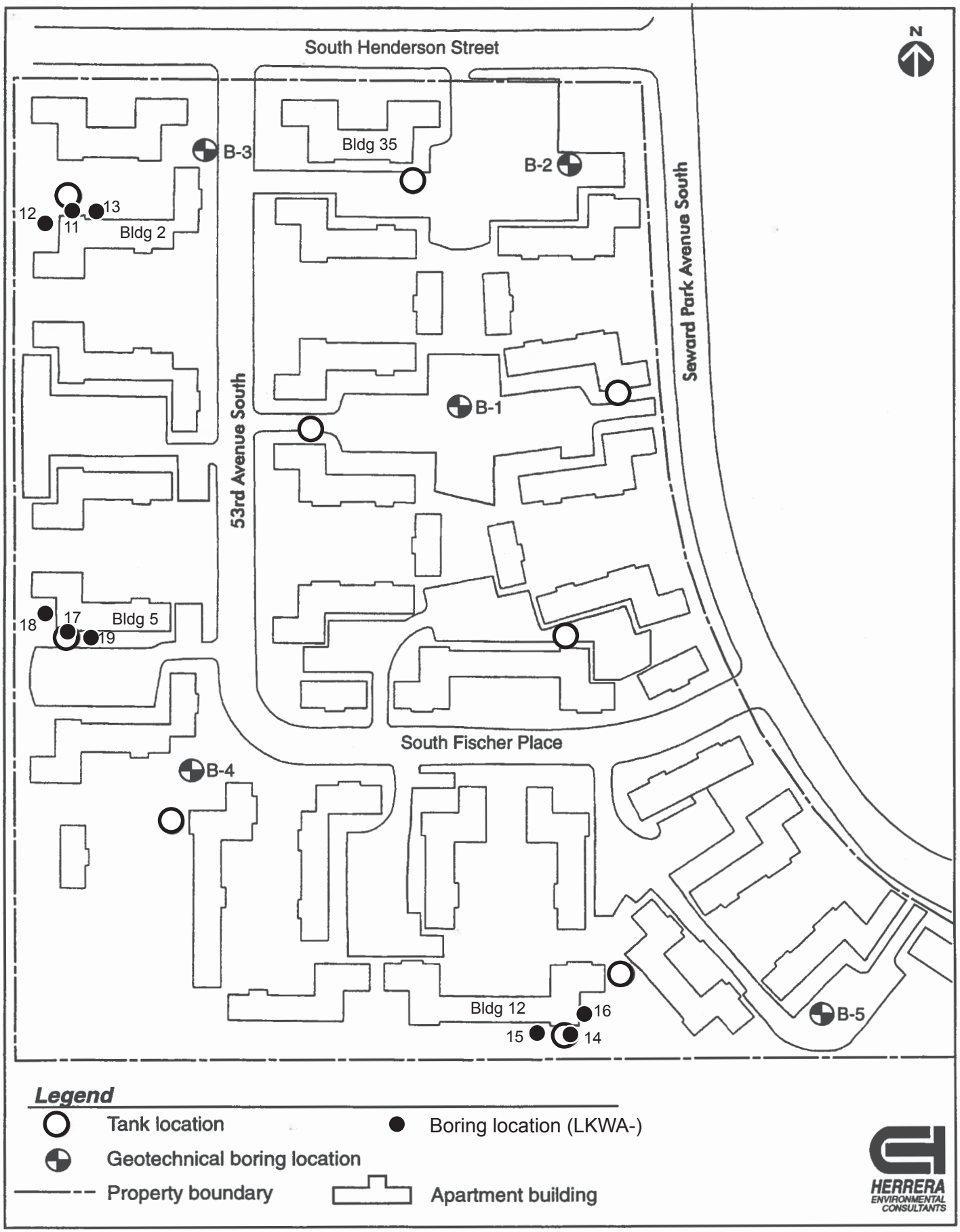

Figure 1. Phase II follow up groundwater characterization, Lake Washington Apartments.

APPENDIX A

Soil Boring Logs

HERRERA ENVIRONMENTAL CONSULTANTS

SOIL PROBE BORING RECORD

Boring ID LKWA-11
Total depth 10
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		NW Corner Bldg 2 ~ 5 ft W of chimney ftg	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
					Topsoil
			1	SM	Brown gravelly SAND, trace of silt and cobbles, (fill), moist
			2		
5-foot long probe sampler	40		3		
		▽			SWL 3.5 feet
			4		
			5		Gray gravelly SAND, trace of silt and cobbles, (fill), wet
			6		
5-foot long probe sampler	35		7		
			8		
			9	MH	Layer of blue gray clayey SILT, wet
			10	PT	Brown peat, wood fragments, fuel odor, wet
					Temporary screen set from 3 to 8 feet to collect water sample. Borehole backfilled with bentonite chips.

HERRERA ENVIRONMENTAL CONSULTANTS

SOIL PROBE BORING RECORD

Boring ID LKWA-12
Total depth 15
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		NW Corner Bldg 2 ~ 8 ft W of building	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
					Grass/Topsoil
			1	SM	Brown gravelly SAND, trace of silt and cobbles, (fill), dry
			2		
5-foot long probe sampler	15				
			3		
					moist
			4		
			5	GP	Brown sandy GRAVEL (pea gravel – fill), moist
			6		
5-foot long probe sampler	60		7		
					SWL 7.83 feet
		▽	8	PT	Brown PEAT, wood fragments, moist
			9		
			10		
				OL	Brown silty CLAY, with organic material, moist
			11		
5-foot long probe sampler	100		12		
				SW	Gray fine to medium SAND, 1-inch layer, wet
			13	CL	Brown gray silty CLAY, moist
				SW	Gray fine to medium SAND, 5-inch layer, wet
			14	CH	Blue gray silty CLAY, moist
				SW	Gray fine to medium SAND, 2-inch layer, wet
			15	CH	Blue gray silty CLAY, moist
					Temporary screen set from 9.5 to 14.5 feet to collect water sample. Borehole backfilled with bentonite chips.

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SOIL PROBE BORING RECORD

Boring ID LKWA-13
Total depth 20
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		North of Bldg 2, East of chimney footing	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
5-foot long probe sampler	40		1	ML	Topsoil Brown gray gravelly sandy SILT, (fill), moist
			2		
			3		
			4	GW	Gray brown gravelly SAND, (fill), moist
		▽	5		SWL 4.34 feet Gray gravelly SAND, (fill) wet
5-foot long probe sampler	40		6		
			7		
			8		
			9	PT	Brown PEAT with silt, moist Temporary screen set from 4 to 9 feet to collect water sample, then drilled to 20 feet
			10		
5-foot long probe sampler	100		11		
			12		
			13		Wood fragments
			14		
			15	OL	Gray brown silty CLAY, moist 1-inch sand layer
5-foot long probe sampler	90		16	CH	Blue gray silty CLAY, moist
			17		
			18		
			19		
			20		Borehole backfilled with bentonite chips.

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SOIL PROBE BORING RECORD

Boring ID LKWA-14
Total depth 15
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		SE Corner Bldg 12, East of chimney footing	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
5-foot long probe sampler	40		0	SW	Topsoil Gray Brown gravelly SAND, (fill), dry
			1		
			2		moist
			3		
			4		
			5		
5-foot long probe sampler	20		6		
			7		
			8		
			9		
		▽	10	SC	Gray brown gravelly clayey SAND, wet, SWL 9.93 feet
5-foot long probe sampler	80		11	PT	Brown PEAT with silt, wood fragments, moist
			12		
			13		
			14		
			15	CH	Blue gray silty CLAY, moist
					Temporary screen set from 8.5 to 13.5 feet to collect water sample. Borehole backfilled with bentonite chips.

HERRERA ENVIRONMENTAL CONSULTANTS

SOIL PROBE BORING RECORD

Boring ID LKWA-15
Total depth 28.5
Sheet 1 of 2

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		SE Corner Bldg 12 W of chimney footing	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
5-foot long probe sampler	20		1	SW	Topsoil Brown gravelly SAND, cobbles, (fill), moist
5-foot long probe sampler	20		6		
			10	SC	Blue gray clayey SAND, gravel, wet
5-foot long probe sampler	10		11	PT	Brown PEAT, moist
5-foot long probe sampler	20		16	CH	Blue gray silty CLAY, moist

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SOIL PROBE BORING RECORD

Boring ID LKWA-15
Total depth 28.5
Sheet 2 of 2

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		SE Corner Bldg 12 W of chimney footing	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
5-foot long probe sampler	100		21	CL	Brown gray silty CLAY, trace sand, mottled, moist
			22	CL	Blue gray silty CLAY, trace sand, moist
			23		
			24		
			25		
3.5-foot long probe sampler	100		26		
			27		
			28		Unable to core below 28.5 feet due to cobbles in borehole.
					Borehole backfilled with bentonite chips.

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SOIL PROBE BORING RECORD

Boring ID LKWA-16
Total depth 15
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		East of SE Corner Bldg 12	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/9/12	Air monitoring (Y/N)	No
		Compl. date	8/9/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
5-foot long probe sampler	40	▽	0	SW	Topsoil
			1		Brown gray silty, gravelly SAND, (fill), moist
			2		
			3		
			4		wet
			5		SWL 4.4 feet
5-foot long probe sampler	80		6		Water perched on top of peat
			7	PT	Brown PEAT, wood fragments, moist
			8		
			9		
			10		
5-foot long probe sampler	55		11		Drilled to 10 feet. Temporary screen set from 3 to 8 feet to collect water sample, then drilled on to 15 feet
			12		
			13		
			14		
			15	CH	Blue gray silty CLAY, moist
					Borehole backfilled with bentonite chips.

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SOIL PROBE BORING RECORD

Boring ID LKWA-17
Total depth 20
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		Bldg 5, 9' W of former chimney footing	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/31/12	Air monitoring (Y/N)	No
		Compl. date	8/31/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
					Grass/Topsoil
			1	GM	Gray brown silty sandy GRAVEL, (fill), wet
			2		
5-foot long probe sampler	60		3		
		▽			SWL 3.6 feet
			4		
			5		Piece of green plastic pipe found in sample, but no void or change in fill material above or below pipe.
			6		
5-foot long probe sampler	50		7		Temporary screen set from 2 to 7 feet to collect water sample.
			8		
			9		
			10		Drilled to 10 feet, collected water sample then drilled on to 20 feet.
			11		
5-foot long probe sampler	60		12		
			13		Crushed rock
			14		
			15	PT	Brown PEAT, wood fragments, trace of silt, moist
			16		
5-foot long probe sampler	80		17		
			18		
			19		
			20	CH	Blue gray silty CLAY, moist. Backfilled with bentonite chips.

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SOIL PROBE BORING RECORD

Boring ID LKWA-18
Total depth 25
Sheet 1 of 2

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		15.5' W and 9' N of SW corner of Bldg 5	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/31/12	Air monitoring (Y/N)	No
		Compl. date	8/31/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
		▽			Grass/Topsoil (Confined water level close to ground surface)
			1	GM	Gray brown silty sandy GRAVEL, (fill), moist
				MH	Gray clayey sandy SILT, moist
5-foot long probe sampler	40		2		
			3		
			4		Crushed rock
			5		
			6		
5-foot long probe sampler	80		7	PT	Brown PEAT, wood fragments, moist
			8		
			9		
			10		
5-foot long probe sampler	70		11		
			12		
			13		Crushed rock
			14		
			15		
5-foot long probe sampler	90		16		
			17		
			18		
			19		
			20	CH	Gray silty CLAY, moist.

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SOIL PROBE BORING RECORD

Boring ID LKWA-18
Total depth 25
Sheet 2 of 2

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		15.5' W and 9' N of SW corner of Bldg 5	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/31/12	Air monitoring (Y/N)	No
		Compl. date	8/31/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
5-foot long probe sampler	100		21	CH	Brown gray silty CLAY, moist
			22		
			23		
			24	SM	Blue gray silty SAND, wet Temporary screen set from 21 to 25 feet to collect water sample.
			25	CH	Blue gray silty CLAY, moist
					Borehole backfilled with bentonite chips.

HERRERA ENVIRONMENTAL CONSULTANTS

SOIL PROBE BORING RECORD

Boring ID LKWA-19
Total depth 20
Sheet 1 of 1

Project name	Lake WA Apts	Drilling Contractor	Cascade	Drilling method	Push-probe rig
Project number	11-05186-000	Location	Lake WA Apartments	Sampling method	5 ft core tube with plastic liner
Client	EPMI		Bldg 5, 5' E of former chimney footing	Ground elevation	NA
HEC rep.	Bruce Carpenter	Start date	8/31/12	Air monitoring (Y/N)	No
		Compl. date	8/31/12	Instrument(s)	NA

Sample type, interval	% recovery	Water level (feet)	Depth (feet, BGS)	Soil group	Soil description
					Grass/Topsoil
			1	ML	Gray brown gravelly SILT, trace of sand, (fill), moist
				GW	Dark gray and light brown, mottled sandy GRAVEL, (fill), moist
5-foot long probe sampler	80		2		
			3		
			4		Dark gray sandy GRAVEL, (fill), wet
		▽			SWL 4.34 feet
			5		
5-foot long probe sampler	60		6		
			7		
			8		Crushed rock/brick, (fill), moist Temporary screen set from 3 to 8 feet to collect water sample.
				PT	Brown PEAT, wood fragments, moist
			9		
			10		Drilled to 10 feet, collected water sample then drilled on to 20 feet.
5-foot long probe sampler	80		11		
			12		
			13		
			14		
			15		
5-foot long probe sampler	100		16		
			17		
			18		
			19		
			20	CH	Blue gray silty CLAY, trace of sand moist. Borehole backfilled with bentonite chips.

APPENDIX B

Laboratory Data Reports

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 22, 2012

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 11-05186-000
Laboratory Reference No. 1208-085

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on August 10, 2012.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: August 22, 2012
Samples Submitted: August 10, 2012
Laboratory Reference: 1208-085
Project: 11-05186-000

Case Narrative

Samples were collected on August 9, 2012 and received by the laboratory on August 10, 2012. They were maintained at the laboratory at a temperature of 2^{o}C to 6^{o}C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: August 22, 2012
Samples Submitted: August 10, 2012
Laboratory Reference: 1208-085
Project: 11-05186-000

NWTPH-Dx
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LKWA-11**					
Laboratory ID:	08-085-01					
Diesel Range Organics	**0.33**	0.26	NWTPH-Dx	8-13-12	8-13-12	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	8-13-12	8-13-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*82*	*50-150*				
Client ID:	**LKWA-14**					
Laboratory ID:	08-085-04					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	8-13-12	8-13-12	
Lube Oil	**0.44**	0.42	NWTPH-Dx	8-13-12	8-13-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*64*	*50-150*				

Date of Report: August 22, 2012
Samples Submitted: August 10, 2012
Laboratory Reference: 1208-085
Project: 11-05186-000

NWTPH-Dx
QUALITY CONTROL
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0813W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	8-13-12	8-13-12	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	8-13-12	8-13-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*74*	*50-150*				

Analyte	Result		Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE							
Laboratory ID:	08-085-01						
	ORIG	DUP					
Diesel Range Organics	**0.327**	**0.305**			7	NA	
Lube Oil Range Organics	**ND**	**ND**			NA	NA	
Surrogate:							
o-Terphenyl			*82* *76*	*50-150*			

Date of Report: August 22, 2012
Samples Submitted: August 10, 2012
Laboratory Reference: 1208-085
Project: 11-05186-000

NWTPH-Dx
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LKWA-12**					
Laboratory ID:	08-085-02					
Diesel Range Organics	**ND**	0.31	NWTPH-Dx	8-21-12	8-22-12	
Lube Oil Range Organics	**ND**	0.49	NWTPH-Dx	8-21-12	8-22-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*111*	*50-150*				
Client ID:	**LKWA-13**					
Laboratory ID:	08-085-03					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	8-21-12	8-22-12	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	8-21-12	8-22-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*102*	*50-150*				
Client ID:	**LKWA-16**					
Laboratory ID:	08-085-05					
Diesel Range Organics	**ND**	0.22	NWTPH-Dx	8-21-12	8-22-12	
Lube Oil Range Organics	**ND**	0.36	NWTPH-Dx	8-21-12	8-22-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*106*	*50-150*				

Date of Report: August 22, 2012
Samples Submitted: August 10, 2012
Laboratory Reference: 1208-085
Project: 11-05186-000

NWTPH-Dx
QUALITY CONTROL
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0821W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	8-21-12	8-21-12	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	8-21-12	8-21-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*101*	*50-150*				

Analyte	Result		Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE							
Laboratory ID:	08-106-01						
	ORIG	DUP					
Diesel Range Organics	**ND**	**ND**			NA	NA	U1
Lube Oil Range Organics	**ND**	**ND**			NA	NA	
Surrogate:							
o-Terphenyl			*108* *102*	*50-150*			

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Herrera Environmental
Project Number: 11-05186-000
Project Name: Lake WA Apartments
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 08-085

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	No. of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260B	Halogenated Volatiles 8260B	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082	Organochlorine Pesticides 8081A	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664					% Moisture
1	LKWA-11	8/9/12	9:45	W	2				X																	
2	LKWA-12		11:10		2				(X)																	
3	LKWA-13		11:45		2				(X)																	
4	LKWA-14		16:00		2				X																	
5	LKWA-16		15:40		1				(X)																	

	Signature	Company	Date	Time
Relinquished	Bruce A. Carpenter	Herrera Environmental	8/10/12	8:30
Received		OSE	8/10/12	1315
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Archive samples LKWA-12, 13, ~~16~~ 15 pending detections in LKWA-11.
Archive sample LKWA-16 pending detections in LKWA-14
(X) Added 8/15/12. DB
Sent via Courier (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☑ _____

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 7, 2012

Bruce Carpenter
Herrera Environmental Consultants, Inc.
2200 6th Avenue, Suite 1100
Seattle, WA 98121

Re: Analytical Data for Project 11-05186-000
Laboratory Reference No. 1209-008

Dear Bruce:

Enclosed are the analytical results and associated quality control data for samples submitted on September 4, 2012.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: September 7, 2012
Samples Submitted: September 4, 2012
Laboratory Reference: 1209-008
Project: 11-05186-000

Case Narrative

Samples were collected on August 31, 2012 and received by the laboratory on September 4, 2012. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: September 7, 2012
Samples Submitted: September 4, 2012
Laboratory Reference: 1209-008
Project: 11-05186-000

NWTPH-Dx
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**LKWA-17**					
Laboratory ID:	09-008-01					
Diesel Range Organics	**ND**	0.26	NWTPH-Dx	9-5-12	9-6-12	
Lube Oil Range Organics	**ND**	0.41	NWTPH-Dx	9-5-12	9-6-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*81*	*50-150*				

Date of Report: September 7, 2012
Samples Submitted: September 4, 2012
Laboratory Reference: 1209-008
Project: 11-05186-000

NWTPH-Dx
QUALITY CONTROL
(with acid/silica gel clean-up)

Matrix: Water
Units: mg/L (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0905W1					
Diesel Range Organics	**ND**	0.25	NWTPH-Dx	9-5-12	9-6-12	
Lube Oil Range Organics	**ND**	0.40	NWTPH-Dx	9-5-12	9-6-12	
Surrogate:	*Percent Recovery*	*Control Limits*				
o-Terphenyl	*80*	*50-150*				

Analyte	Result		Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE							
Laboratory ID:	09-008-01						
	ORIG	DUP					
Diesel Range Organics	**ND**	**ND**			NA	NA	
Lube Oil Range Organics	**ND**	**ND**			NA	NA	
Surrogate:							
o-Terphenyl			*81* *85*	*50-150*			

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

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B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

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M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

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Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
Phone: (425) 883-3881 • Fax: (425) 885-4603

Company: Herrera Environmental
Project Number: 11-05186-000
Project Name: Lake WA Apartments
Project Manager: Bruce Carpenter
Sampled by: Bruce Carpenter

Turnaround Request (in working days)

(Check One)

- ☐ Same Day ☐ 1 Day
- ☐ 2 Day ☐ 3 Day
- ☒ Standard (7 working days)
  (TPH analysis 5 working days)
- ☐ _____ (other)

Laboratory Number: 09-008

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270D	PAHs by 8270D / SIM	PCBs by 8082	Pesticides by 8081A	Herbicides by 8151A	Total RCRA Metals (8)	TCLP Metals	HEM by 1664	% Moisture
1	LKWA-17	8/31/12	8:55	W	2			X											
2	LKWA-18	↓	11:05	↓	2														
3	LKWA-19	↓	1155	↓	2														

	Signature	Company	Date	Time
Relinquished by		Herrera Environmental	9/4/12	8:30
Received by			9/4/12	1347
Relinquished by				
Received by				
Relinquished by				
Received by				
Reviewed by/Date		Reviewed by/Date		

Comments/Special Instructions:

Sent via Courier
Please archive LKWA-18 and LKWA-19 pending direction in LKWA-17.

Chromatograms with final report ☐

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy