Remedial Investigation Report Addendum 2

BOEING KENT SPACE CENTER FACILITY
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KENT, WASHINGTON

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Table of Contents

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1.0 INTRODUCTION

This August 2018 Remedial Investigation (RI) Addendum was prepared by Dalton, Olmsted, and Fuglevand (DOF) on behalf of the Boeing Company (Boeing). The purpose of this second Addendum is to present results of investigation performed after submittal of the draft RI and first Addendum, and propose additional work to resolve data gaps identified during performance of these subsequent investigations.

Boeing submitted a draft RI Report in December 2017 (DOF, 2017) and an earlier 2018 RI Addendum that included sediment trap results (DOF, 2018). Boeing received an email from the Department of Ecology (Ecology) on March 30, 2018 with comments and questions regarding these documents. A technical meeting was held between Boeing, Ecology, and DOF in April 2018 to discuss Ecology's comments and questions on the RI. Boeing shared recent soil and groundwater results from an environmental investigation that Boeing real estate (and their consultant) performed in support of property due diligence that pertained to some of Ecology's questions. Boeing also agreed to conduct additional sampling to further evaluate polychlorinated biphenyls (PCBs) as part of the RI. This additional soil and groundwater sampling was conducted in May 2018. Results are presented in this Addendum.

The real estate investigation was conducted over the course of the past year and is now complete. Results of that investigation are summarized in this Addendum; the complete Phase II Environmental Site Assessment Report will be provided to Ecology once it is received by Boeing. The Phase II Report will include laboratory and data validation reports which a not documented in this Addendum.

2.0 ADDITIONAL PCB INVESTIGATION

Two sediment samples were collected by Boeing real estate's consultant (Landau) in the storm ditch along the east side of the site in July 2018. These samples were identified as BD1 and BD2, shown on Figure 1. Results are presented in Table 13, along with other soil samples collected in order to document baseline conditions for potential stormwater management areas under review by Boeing real estate. PCBs were not detected in either of the samples collected from the existing ditch.

In addition, DOF completed five additional temporary borings (SB-21 through SB-25, Figure 1) for soil and groundwater sampling on May 7, 2018. These sampling locations were identified in collaboration with Ecology based on their close proximity to stormwater lines, an electrical substation, and Building 18-59. The 1998 Closure Report for Building 18-59 Container Storage Area (TetraTech, 1998) identified PCB concentrations in soil as high as 500 ug/kg, but did not include any groundwater sampling.

Drilling was completed by Washington licensed drillers from Holt Drilling using a direct push drill rig. Soil was continuously collected for screening, logging, and sampling via two-inch diameter macro samplers with acrylic liner. Shallow soil samples were collected for analysis of PCBs. Boring logs showing the lithology observed are included as Appendix A. Indications of contamination were not observed at any of the sampling locations.

Shallow groundwater samples were collected for PCB analysis using a groundwater sampler consisting of a five-feet long, ¾-inch diameter temporary PVC well and screen (0.010-inch slot size). Groundwater samples were collected via low-flow purging with a peristaltic pump and disposable tubing.

Samples were analyzed by Analytical Resources Inc. for PCBs using EPA Method 8082. Once the laboratory produced reports and Electronic Data Deliverables (EDDs) for the data, the data were reviewed and validated, consistent with the RI Work Plan (Landau, 2016) by EcoChem, Inc. The analytical and data validation reports are included as Appendix B. Data were also uploaded to Ecology's Electronic Information System (EIM), in accordance with the requirements of the Agreed Order. All data were found to be usable, as discussed in the data validation memoranda.

2.1 Results

Results of all RI PCB sampling are shown in Tables 1 (soil and solids) and 2 (groundwater and stormwater), along with data from historical studies provided for reference. These data show that results are consistent and generally lower than those anticipated by earlier studies, specifically:

- PCBs were not detected in soil or groundwater samples collected at SB23 or SB25.
- The only detection of PCBs in a groundwater sample was Aroclor 1254 at SB22, where it was detected at a concentration of 0.008 µg/L, near the limit of analytical detection and below the standard reporting limit. This is also slightly lower than the one detection in stormwater samples collected as part of the RI (0.012 µg/).
- The only detections of PCBs in soil were also Aroclor 1254, detected at KSC-SB-21 at 20.3 µg/kg and KSC-SB-24 at 8.4 µg/kg. Both of these are well below the detections from the stormwater system solids samples collected as part of the RI.

2.2 Conclusions

PCBs samples were collected near suspected historical or potential current sources of PCBs to soil and groundwater contamination. As presented in the draft RI Report, the data collected as part of the RI are generally consistent with regional and historical data, and with what might be expected for a similar industrial site that is well-maintained with underutilized parking and traffic. Results do not indicate the presence of an unidentified source contributing to site contamination. Higher concentrations detected in stormwater system samples are likely from an anthropogenic source typical of the urban environment.

3.0 BOEING PROPERTY DUE DILIGENCE INVESTIGATION

As part of due diligence property evaluation, Boeing real estate collected additional soil, groundwater, soil vapor and stormwater system data at the property over the last year. Boeing real estate's consultant, Landau Associates, collected groundwater samples from 28 locations (including the seven monitoring wells installed as part of the RI), soil samples from 28 locations, storm system baseline soil and sediment samples from 8 locations, and soil vapor samples from 34 locations between late 2017 and summer 2018. These results have been combined with the RI data set for presentation in this memo to aid in the completion of the RI.

Figure 1 shows these sampling locations along with those performed as part of the RI. Results of additional due diligence sampling are summarized in Tables 3 to 14. Tables include summary results for detected compounds. The data collected as part of the due diligence project has been screened against current MTCA values from CLARC including the RI screening levels where available, Method B groundwater values (and MCLs), and Method C soil and soil gas values. Soil and groundwater sampling

was conducted during separate events in November 2017, May 2018, and July 2018. Soil vapor sampling was conducted in December 2017, January 2018, May 2018, and July 2018. In some cases soil vapor sampling points were resampled during separate events. Sampling soil vapor is a standard component of Boeing's due diligence site assessment process and frequently used to evaluate the need for additional soil or groundwater sampling as well potential risks to existing or future buildings. Permanent sampling ports were installed and used at such locations. Boring logs showing lithology and vapor sampling port construction are included in Appendix A.

The following subsections discuss results that are pertinent to completion of the RI and comments previously discussed with Ecology.

3.1 Arsenic Data Gap Investigation

Ecology indicated in their March 2018 email to Boeing regarding the RI Report that additional evaluation of arsenic in the north-northwest corner of the property was warranted based on reported concentrations. SWMU-23 was also noted as a potential source of arsenic contamination in groundwater based on its historical use and nearby detections. Ecology requested further evaluation of arsenic in soil and groundwater in these two areas to confirm the soil concentrations, check for source areas, and to delineate the arsenic concentrations in groundwater.

As part of the due diligence property evaluation, Boeing real estate collected additional soil and groundwater data for arsenic at the property over the last year. Boeing real estate's consultant, Landau Associates, collected 14 groundwater and 22 soil samples that were analyzed for arsenic.

3.1.1 Results

Results of due diligence arsenic sampling are presented along with data from historical studies in Tables 3 and 4. Compared to results presented in the RI, the new results are similarly highly variable.

In the north-northwest area of the site, the additional results confirm there does appear to be an area of higher concentration arsenic in groundwater, with several results over 100 µg/L (Table 4); however soil samples from this area within the range of previously collected samples and do not indicate a release to soil that is contributing directly to the groundwater concentrations. Soil concentrations ranged from 1.31 to 18.1 mg/kg without clear correlation between higher soil concentrations and areas where groundwater concentrations are higher. Notably, a new northernmost (downgradient) sample was collected (LAI34) showing an arsenic concentrations at the low end of those collected (3.85 µg/L).

In the south end of the property new samples collected near the higher concentration detection located at SB-12 (266 µg/L) showed lower concentrations at surrounding borings, ranging from 8 to 91 µg/L. Soil samples collected in this area also did not indicate a specific release ranging from 2.33 to 7.04 mg/kg.

Newly collected soil data confirmed earlier results (Table 3), showing a similar distribution, with an average RI soil sample concentration of 5.6 mg/kg, below the state-determined regional soil background concentration of 7.3 mg/kg. Similar to past assessments conducted in the area and discussed in the RI, the updated dataset indicates that the elevated concentrations of arsenic detected in groundwater at several locations appear to be isolated and are not associated with known releases of arsenic.

The shallow groundwater is not used for drinking purposes and Boeing is willing to file an environmental covenant for the property to restrict the use of groundwater from the site.

3.2 Other Pertinent Results

Results of the abundant due diligence sampling effort performed over the last year add clarity to the RI dataset. Generally results confirmed low concentrations of constituents tested across the site and solidify the site characterization developed to date. However, results also indicate that two RI SWMU areas warrant further evaluation. One area is in the vicinity of AOC-2, the former UST KS-7 located near the former Building 18-24 on the west side of the site and the other is near Building 18-62 (former Milling Machine Area) at the south end of the site near the former Building 18-63. These areas are discussed in the following sections.

3.2.1 Former Building 18-24 Area

Results of data collected in this area are highlighted in Tables 5 through 8 (soil and groundwater results for TPH and VOCs) and Table 14 (soil vapor results). While soil sampling results did not reveal any sources of contamination in the area, several low level VOCs were detected in groundwater in this area, as well as groundwater detection of gasoline at 1,470 µg/L. As part of the RI sampling vinyl chloride at 0.19 µg/L was detected at locations SB-6 and SB-8 and then during due diligence sampling 1,1-dichloroethene was detected at 8.77 µg/L at location LAI19. Several SVOCs were also detected at LAI19 at relatively low levels (Tables 9 and 10). The new soil and groundwater data did not change the conclusions about this area made in the RI or in the neighboring Clearwater evaluations completed historically. These values are not indicative of an unidentified source of contamination contributing to the detections initially detected during the Clearwater investigation. Values are low, confirming the area where vinyl chloride is detected is small, and may be declining naturally as concentrations from the RI are an order of magnitude lower than detected during the Clearwater investigation.

Despite low soil and groundwater concentrations, several VOCs were detected in soil vapor samples collected from this area, including trichloroethene, benzene, 1,2,4-trimethylbenzene, and trichlorofluoromethane at levels slightly above Ecology's MTCA Method C Sub-Slab Soil Gas Screening Level. Based on these detections further consideration of this area is proposed.

The following supplemental data collection tasks are proposed:

- Review and documentation of historical information regarding former Building 18-24 use and demolition. A source for these specific contaminants has not been identified; however the RI focused on the UST KS-7 in this area, which was located north of the soil gas detections.
- Completion of three direct push temporary groundwater sampling points in the area. Proposed locations are shown on Figure 1. One boring is proposed to the north, west, and south of the area of soil gas detections mentioned. The area to the east is well bounded by previous sampling location LAI20 and existing monitoring well MW-6, neither of which showed detections of VOCs above screening levels.
- Sampling of multiple groundwater depths at each of the three direct push points to identify if higher concentrations of VOCs exist at depth. At each location a groundwater sample will be collected from the water table and three subsequent depths at the same location. Samples will be collected via direct push equipment utilizing a four to five foot screen. Tentative sampling depths proposed based on previous sampling are:
    - 7 to 11 feet below ground surface (bgs);
    - 16 to 20 feet bgs;

  - 25 to 29 feet bgs; and
  - 34 to 38 feet bgs.
- Laboratory analysis of VOCs by EPA Method 8260 and gasoline range petroleum hydrocarbons by Ecology Method NWTPH-Gx. The two shallowest depth zones will be analyzed on a rush turnaround for each sample location. If chlorinated VOCs, benzene (or benzene related compounds such as 1,2,4-trimethylbenzene), or gasoline are detected, the two deeper samples will also be analyzed. One shallow sample will also be collected and analyzed for total organic carbon.
- Continuous visual logging of soil, along with field screening using a photoionization detector (PID) during drilling will be conducted at each boring to total depth.

3.2.2 Former Building 18-63 Area

Results of data collected in this area are highlighted in Tables 5 through 8 (soil and groundwater results for TPH and VOCs) and Table 14 (soil vapor results). While soil sampling results did not reveal any sources of contamination in the area, several VOCs were detected in groundwater in this area, as well as groundwater detections of diesel and oil range petroleum. The due diligence groundwater samples with elevated diesel and oil detections were tested using both silica gel cleanup preparation and without. Results of the samples that included the silica gel cleanup were all below the RI screening level, as shown in Table 8. The VOC detected in groundwater above screening levels during due diligence sampling included 1,1-dichloroethene at 36.2 µg/L at location LAI14 and vinyl chloride at three locations with concentrations up to 12.6 µg/L at LAI32.

Soil vapor data also revealed benzene, chloroform, and 1,3-butadiene concentrations above Ecology's MTCA Method C Sub-Slab Soil Gas Screening Level at several locations (LAI14, LAI30 and LAI31) in this area. Based on these detections further consideration of this area is proposed. The following supplemental data collection tasks are proposed:

- Review and documentation of historical information regarding former Building 18-63 use and demolition and existing Building 18-62 use. A source for these specific contaminants has not been identified; however the RI focused on the 18-62 Milling Area, which was located north of the recent groundwater and soil vapor detections.
- Completion of two direct push temporary groundwater sampling points in the area. Proposed locations are shown on Figure 1. One boring is proposed near the location of sample LAI32 where the highest groundwater detection of vinyl chloride was (12.6 µg/L). Other samples collected east, west, and south of that point were all below the RI screening level, including the nearest permanent monitoring well MW-4. A second boring is proposed north of LAI32, immediately next to the 18-62 building which is downgradient of LAI32, and near the point LAI31 where vinyl chloride was also detected in groundwater but at a much lower concentration (0.29 µg/L).
- Sampling of multiple groundwater depths at each of the two direct push points to identify if higher concentrations of VOCs exist at depth. At each location a groundwater sample will be collected from the water table and three subsequent depths at the same location. Samples will be collected via direct push equipment utilizing a four to five foot screen. Tentative sampling depths proposed based on previous sampling are:

  - 7 to 11 feet below ground surface (bgs);
  - 16 to 20 feet bgs;
  - 25 to 29 feet bgs; and
  - 34 to 38 feet bgs.
- Laboratory analysis of VOCs by EPA Method 8260 and diesel and oil range petroleum hydrocarbons by Ecology Method NWTPH-Dx without silica gel cleanup (consistent with the RI Work Plan methods for groundwater samples). The two shallowest depth zones will be analyzed on a rush turnaround for each sample location. If chlorinated VOCs, benzene (or benzene related compounds such as 1,2,4-trimethylbenzene), chloroform, or 1,3-butadiene, are detected, the two deeper samples will also be analyzed. One shallow sample will also be collected and analyzed for total organic carbon.
- Continuous visual logging of soil, along with field screening using a photoionization detector (PID) during drilling will be conducted at each boring to total depth.

4.0 METHODS AND REPORTING FOR FURTHER FIELD INVESTIGATION

Sample collection methods and data quality protocols for work proposed in this Addendum will follow those included in the Final RI Work Plan (Landau, 2016).

Once laboratory data are received and validated, results will be reviewed with Ecology to determine if further characterization is warranted or if Boeing may proceed to finalization of the RI. The investigation performed to date is consistent with the RI approach outlined by Ecology in their Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (Publication 09-09-047), updated in April 2018. Reference to this document and how the additional data fit in under that approach to characterization will be included in the final RI.

Full laboratory reports for the due diligence data described in the Addendum will be reported to Ecology in a future bimonthly report once the Phase II Report is finalized by Landau.

5.0 REFERENCES

DOF, 2017. Draft Remedial Investigation Report, Boeing Kent Space Center Facility, Kent, Washington, prepared for the Boeing Company, prepared by DOF, Seattle, Washington, December 28.

DOF, 2018. 2018 RI Addendum, Boeing Kent Space Center Facility, Kent, Washington, prepared for the Boeing Company, prepared by DOF, Seattle, Washington.

Ecology, 2018. Email from Byung Maeng to Lindsey Mahrt, Subject: Ecology comments on Boeing KSC RI report and its addendum, March 30.

Landau, 2018. Email from Kathryn Hartley to Lindsey Mahrt, Subject: Kent Space Center Figure and Data Tables, September 2.

Landau, 2016. Final Remedial Investigation Work Plan, Boeing Kent Space Center Facility, Kent, Washington, prepared for the Boeing Company, prepared by Landau Associates, Edmonds, Washington, October 12.

TetraTech, 1998. Closure Report, Building 18-59 Container Storage Area, Boeing Space Center, Kent, Washington, September.

6.0 CLOSING

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

Tables

Table 1
Soil/Stormwater Solids Results - PCBs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Area	Sample Location ID	Sample Depth BGS (feet)	PCBs (µg/kg)									
				Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCBs
				RI Storm Solids Screening Level									110
Soil Borings													
5/7/2018	West of 18-59	KSC-SB21	1-3	18.1 U	18.1 U	18.1 U	18.1 U	18.1 U	20.3	18.1 U	18.1 U	18.1 U	20.3
5/7/2018	South of 18-59	KSC-SB22	1-3	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	ND
5/7/2018	Substation	KSC-SB23	1-3	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	17.9 U	ND
5/7/2018	Substation	KSC-SB24	1-3	18.3 U	18.3 U	18.3 U	18.3 U	18.3 U	8.4 J	18.3 U	18.3 U	18.3 U	8.4 J
5/7/2018	Substation	KSC-SB25	1-3	19.0 U	19.0 U	19.0 U	19.0 U	19.0 U	19.0 U	19.0 U	19.0 U	19.0 U	ND
Storm System Solids													
12/20/2017	Manhole 20.237M	KSC-MH-20.237M-1217	0-0.3	19.5 U	19.5 U	19.5 U	19.5 U	84.6	199	71.7	--	--	**355.3**
12/20/2017	Manhole 20.236M	KSC-MH-20.236M-1217	0-0.3	150 U	150 U	150 U	150 U	150 U	1480	497	--	--	**1977**
12/20/2017	Manhole 16.12M	KSC-MH-16.12M-1217	INSUFFICIENT VOLUME										
12/20/2017	Manhole 15.10M	KSC-MH-15.10M-1217	0-0.3	19.4 U	19.4 U	19.4 U	19.4 U	48.4 U	126	80.8	--	--	**206.8**
6/29/2017	Outfall-Mill Creek 20/20B	OF-20	0-0.3	18.3 U	18.3 U	18.3 U	18.3 U	18.3 U	18.3 U	18.3 U	18.3 U	18.3 U	ND
5/4/2017	Outfall- East Drainage Ditch 16	KSC-OF-16-0.3	0-0.3	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	17.6 U	--	--	ND
5/4/2017	Outfall-North Detention Pond	OF-DP-0.3	0-0.3	19.5 U	19.5 U	19.5 U	19.5 U	19.5 U	122	67.5	--	--	**189.5**

Notes and Abbreviations

Bolded values are above Remedial Investigation (RI) Screening Level
BGS = below ground surface
PCBs = polychlorinated biphenyl
U = not detected above the value shown
J = Estimated concentration value detected below the reporting limit.
µg/kg = migrograms per kilogram
ND = Analyte not detected at or above the reporting limit.
MH 20.236 has previously been referred to as MH 20.235

Table 2
Groundwater/Stormwater Results - PCBs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	PCBs (µg/L)									
			Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCB's
RI Stormwater Screening Level			**0.003**					**0.0001**	**0.014**			**0.00006**
Groundwater												
5/7/2018	West of 18-59	KSC-SB21	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
5/7/2018	South of 18-59	KSC-SB22	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	**0.008 J**	0.010 U	0.010 U	0.010 U	**0.008 J**
5/7/2018	Substation	KSC-SB23	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
5/7/2018	Substation	KSC-SB24	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
5/7/2018	Substation	KSC-SB25	0.010 U	0.011 U	0.012 U	0.013 U	0.014 U	0.015 U	0.016 U	0.017 U	0.018 U	ND
Stormwater												
1/18/2017	Manhole	MH-20.237-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
1/18/2017	Manhole	MH-20.236-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	**0.012**	0.010 U	0.010 U	0.010 U	**0.012**
1/18/2017	Manhole	MH-16.12-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
1/18/2017	Manhole	MH-15.10-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
1/20/2017	Outfall-Mill Creek 20/20B	OF-20-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
1/18/2017	Outfall- East Drainage Ditch 16	OF-16-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND
1/18/2017	Outfall-North Detention Pond	OF-NDP-W	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	ND

Notes and Abbreviations

Bolded values are above Remedial Investigation (RI) Screening Level

PCBs = polychlorinated biphenyl

U = not detected above the value shown

J = Estimated concentration value detected below the reporting limit.

µg/L = migrograms per liter

ND = Analyte not detected at or above the reporting limit.

MH 20.236 has previously been referred to as MH 20.235

Table 3
Soil Results - Arsenic
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Area	Sample Location ID	Sample Depth BGS (feet)	Arsenic (mg/kg)
			RI Screening Level	**7.3**
RI Soil Results				
1/24/2017	SWMU 88/89 - Building 18-43	SB-1	11.5-12.5	**7.57**
1/24/2017	SWMU 88/89 - Building 18-43	SB-2	11.5-12.5	**8.59**
1/27/2017	AOC-1/3 - Building 18-54	SB-3	8.5-9.5	6.71 J
4/12/2017	north	MW1	2.5	1.31 J
4/11/2017	northeast	MW2	2.5	4.78 J
4/11/2017	east	MW3	2.5	3.26 J
4/11/2017	southeast	MW4	2.5	5.76 J
4/11/2017	southwest	MW5	2.5	3.44 J
4/13/2017	west	MW6	2.5	4.64 J
4/11/2017	northwest	MW7	2.5	2.93 J
Due Diligence Soil Results				
11/14/2017	northwest - storage	LAI1	1-3	2.65
			8-10	6.2
11/14/2017	northwest - storage	LAI2	1-3	3.1
			6.3-8.3	3.73
11/15/2017	north - storage	LAI3	0.7-2.7	3.92
			5.5-7.5	**9.41**
11/15/2017	north - Building 18-43	LAI4	0.7-2.7	2.65
			6.7-8.7	**9.52**
11/15/2017	northeast - Building 18-47	LAI7	1-3	4.26
			8-10	3.98
11/13/2017	south - former Building 18-63	LAI13	1-3	2.77
			8-10	7.04
11/13/2017	southwest - parking lot	LAI18	1-3	2.33
			6-8	3.08
7/11/2018	west - former Building 18-24	LAI19	1.5-3	**18.1 J**
			11-13	4.72
11/14/2017	northwest - 18-59 storage	LAI21	0.3-2.3	3.23
			6.5-8.5	**7.59**
11/14/2017	northwest - 18-59 storage	LAI22	6.3-8.3	**7.81**
			10-12	4.95
5/21/2018	north - downgradient	LAI34	1-3	5.47
			10.5-12.5	**14.2**
Historical Striker Soil Results				
7/29/2010	--	KSC-DP-3	7-8	2.2
7/29/2010	--	KSC-DP-7	3.5-4	3
7/29/2010	--	KSC-DP-8	4.5-5	1.5
7/29/2010	--	KSC-DP-9	5.5-6	1.8
7/30/2010	--	KSC-DP-11	5-5.5	3.2
7/30/2010	--	KSC-DP-13	4.5-5	3.5
7/30/2010	--	KSC-DP-16	7.5-8	7.6
1/27/2011	--	KSC-DP-17	4-5	2.6
1/27/2011	--	KSC-DP-18	4-5	1.9
1/27/2011	--	KSC-DP-19	3.5-4.5	2.3
1/27/2011	--	KSC-DP-20	4.5-5.5	2.6
1/25/2011	--	KSC-DP-26	1-1.5	3.1
1/25/2011	--	KSC-DP-27	1-2	3.5
1/25/2011	--	KSC-DP-28	2.5-3.5	3.8
1/25/2011	--	KSC-DP-29	7-8	4.1
1/25/2011	--	KSC-DP-30	2.5-3.5	4.7
1/26/2011	--	KSC-DP-31	5-6	4.3
1/26/2011	--	KSC-DP-32	3.5-4.5	**7.7**
1/26/2011	--	KSC-DP-33	1.5-2.5	**8.6**

Notes and Abbreviations
Bolded values are above Remedial Investigation (RI) Screening Level
BGS = below ground surface
J = Estimated concentration value detected below the reporting limit.

Table 4
Groundwater Results - Arsenic
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Sample Location Area	Sample Location ID	Dissolved Arsenic (µg/L)
		RI Screening Level	**0.02**
RI Groundwater Results			
1/24/2017	SWMU 88/89 - Building 18-43	SB-1	**193**
1/24/2017	SWMU 88/89 - Building 18-43	SB-2	**133**
1/27/2017	AOC-1/3 - Building 18-54	SB-3	**51.1**
1/24/2017	AOC-2 - Building 18-35	SB-8	**48.3**
1/25/2017	Building 18-62 Milling	SB-12	**266**
1/26/2017	Building 18-67 UST	SB-13	**16.7**
1/26/2017	Building 18-42 - KS-1	SB-14	**105**
1/26/2017	Building 18-41 - KS-3	SB-17	<2
5/4/2017	north	MW1	**85.2**
5/3/2017	northeast	MW2	**28.2**
5/3/2017	east	MW3	**25.6**
5/3/2017	southeast	MW4	**18.9**
		MW4 Duplicate	**18.4**
5/3/2017	southwest	MW5	**3.3**
5/4/2017	west	MW6	**27.9**
5/4/2017	northwest	MW7	**27.1**
Due Diligence Groundwater Results			
11/14/2017	northwest - storage	LAI2	**186**
11/15/2017	north - storage	LAI3	**144**
11/15/2017	north - Building 18-43	LAI4	**67.6**
11/16/2017	north - parking lot	LAI5	**55.6**
11/15/2017	east - parking lot	LAI9	**78.1**
11/15/2017	southeast - parking lot	LAI11	**59.7**
11/13/2017	south - former Building 18-63	LAI13	**91.4**
11/13/2017	southwest - parking lot	LAI16	**62.3**
11/13/2017	southwest - parking lot	LAI18	**8**
7/11/2018	west - former Building 18-24	LAI19	**43.9**
11/14/2017	northwest - 18-59 storage	LAI21	**269**
11/14/2017	northwest - 18-59 storage	LAI22	**120**
5/21/2018	south - former Building 18-63	LAI32	**44.8**
5/21/2018	north - downgradient	LAI34	**3.85**
Historical Groundwater Results			
1/25/2012	Striker	KSC-DP-34	**12.6**
1/25/2012		KSC-DP-35	**15**
1/25/2012		KSC-DP-36	**47.1**
1/25/2012		KSC-DP-37	**5.2**
1/25/2012		KSC-DP-38	**27.9**
1/25/2012		KSC-DP-39	**58.4**
1/25/2012		KSC-DP-40	**3.3**
1/25/2012		KSC-DP-41	**3.3**
2/9/2012		KSC-DP-42	**6**
2/9/2012		Kent-1	**59.6**
2/9/2012		Kent-2	<2
2/8/2012		Kent-3	<2
2/8/2012		Kent-4	<2
2/8/2012		Kent-6	**3.9**
2/9/2012		Kent-7	**115**
2/9/2012		Kent-8	**14.5**

Table 4
Groundwater Results - Arsenic
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Sample Location Area	Sample Location ID	Dissolved Arsenic (µg/L)
		RI Screening Level	**0.02**
2/9/2012		15M17S	<2
2/9/2012		15M30A	**10.8**
7/28/2010	Striker	KSC-DP-1	**23.8**
7/30/2010		KSC-DP-2	**8.1**
7/30/2010		KSC-DP-3	**40.3**
7/29/2010		KSC-DP-4	**9.6**
7/30/2010		KSC-DP-5	**120**
7/29/2010		KSC-DP-9	**13.8**
7/30/2010		KSC-DP-11	**43.8**
7/30/2010		KSC-DP-15	**9.1**
7/30/2010		KSC-DP-16	**53.3**
1/27/2011		KSC-DP-17	**59.9**
1/27/2011		KSC-DP-18	**115**
1/27/2011		KSC-DP-19	**77**
1/27/2011		KSC-DP-20	**33.7**
1/26/2011		KSC-DP-22	**66**
1/26/2011		KSC-DP-23	**66.7**
1/26/2011		KSC-DP-24	**2.7**
1/26/2011		KSC-DP-25b	**71.6**
1/25/2011		KSC-DP-26	**0.8**
1/25/2011		KSC-DP-27	**111**
1/25/2011		KSC-DP-28	**18**
1/25/2011		KSC-DP-29	**1.1**
1/25/2011		KSC-DP-30	**31.9**
1/26/2011		KSC-DP-31	**65.4**
1/26/2011		KSC-DP-32	**2.8**
1/26/2011		KSC-DP-33	**0.3**
11/21/1994		92MW-01	**19**
11/21/1994		92MW-02	**17**
11/21/1994		92MW-03	**25**
11/21/1994		93MW-04	**17**
11/21/1994		93MW-05	**16**
4/27/2009		MW-1	**27**
4/27/2009		MW-2	**24**
4/27/2009		MW-3	**51**
10/26/1998		P-1	**42**
10/26/1998		P-2	**13**
10/26/1998		P-3	**18**
10/26/1998		P-4	**21**
3/6/2000		KGC-MW-1	**19**
3/6/2000		KGC-MW-2	**3**
3/6/2000		KGC-MW-3	**12**

Notes and Abbreviations

Bolded values are above Remedial Investigation Screening Level

ug/L = micrograms per liter

J = Estimated concentration value detected below the reporting limit.

Table 5
Soil Results - VOCs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Area	Sample Location ID	Sample Depth BGS (feet)	Detected VOCs (mg/kg)																		
				1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone/ MEK	2-Hexanone	4-Isopropyltoluene	Acetone	Benzene	Carbon Disulfide	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl Iodide	Methylene Chloride	Naphthalene	o-Xylene	Styrene	Toluene	Total Xylenes	Trichlorofluoromethane (CFC 11)
Method C Soil Screening Level				**4.5.E+03**	**--**	**4.E+04**	**2.1.E+06**	**--**	**--**	**3.2.E+06**	**2.4.E+03**	**3.5.E+05**	**3.5.E+05**	**3.5.E+05**	**7.00E+05**	**--**	**6.6.E+04**	**7.0.E+04**	**7.0.E+05**	**7.0.E+05**	**2.8.E+05**	**7.0.E+05**	**1.1.E+06**
RI Soil Results																						
None collected				--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Due Diligence Soil Results																						
11/14/2017	northwest - storage	LAI1	1-3	0.00446 U	0.00089 U	0.00089 U	0.00446 U	0.00446 U	0.00089 U	0.0112	0.00089 U	0.00089 U	0.00089 U	0.00089 U	0.00178 U	0.00089 U	0.00178 U	0.00446 U	0.00089 U	0.00089 U	0.00089 U	0.00178 U	0.00089 U
			8-10	0.00580 U	0.00116 U	0.00116 U	0.00580 U	0.00580 U	0.00116 U	0.0293	0.00116 U	0.00116 U	0.00116 U	0.00116 U	0.00232 U	0.00116 U	0.00232 U	0.00580 U	0.00116 U	0.00116 U	0.00116 U	0.00232 U	0.00116 U
11/14/2017	northwest - storage	LAI2	1-3	0.00459 U	0.00092 U	0.00092 U	0.00459 U	0.00459 U	0.00092 U	0.0110	0.00092 U	0.00092 U	0.00092 U	0.00092 U	0.00184 U	0.00092 U	0.00184 U	0.00459 U	0.00092 U	0.00092 U	0.00092 U	0.00184 U	0.00092 U
			6.3-8.3	0.00607 U	0.00121 U	0.00121 U	0.0368	0.00607 U	0.00121 U	0.152	0.00121 U	0.00121 U	0.00121 U	0.00121 U	0.00243 U	0.00121 U	0.00243 U	0.00607 U	0.00121 U	0.00121 U	0.00121 U	0.00243 U	0.00121 U
11/15/2017	north - storage	LAI3	0.7-2.7	0.00463 U	0.00093 U	0.00093 U	0.00463 U	0.00463 U	0.00093 U	0.0116	0.00093 U	0.00093 U	0.00093 U	0.00093 U	0.00185 U	0.00093 U	0.00185 U	0.00463 U	0.00093 U	0.00093 U	0.00093 U	0.00185 U	0.00093 U
			5.5-7.5	0.00727 U	0.00145 U	0.00145 U	0.00727 U	0.00727 U	0.00145 U	0.0326	0.00145 U	0.00145 U	0.00145 U	0.00145 U	0.00291 U	0.00145 U	0.00291 U	0.00727 U	0.00145 U	0.00145 U	0.00145 U	0.00291 U	0.00145 U
11/15/2017	north - Building 18-43	LAI4	0.7-2.7	0.00488 U	0.00098 U	0.00098 U	0.00488 U	0.00488 U	0.00098 U	0.0131	0.00098 U	0.00098 U	0.00098 U	0.00098 U	0.00195 U	0.00098 U	0.00195 U	0.00488 U	0.00098 U	0.00098 U	0.00098 U	0.00195 U	0.00098 U
			6.7-8.7	0.00649 U	0.00130 U	0.00130 U	0.0114	0.00649 U	0.00130 U	0.0596	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00260 U	0.00130 U	0.00260 U	0.00649 U	0.00130 U	0.00130 U	0.00130 U	0.00260 U	0.00130 U
11/15/2017	northeast - Building 18-47	LAI7	1-3	0.00555 U	0.00111 U	0.00111 U	0.00696	0.00555 U	0.00111 U	0.0389	0.00111 U	0.00129	0.00111 U	0.00111 U	0.00222 U	0.00111 U	0.00222 U	0.00555 U	0.00111 U	0.00111 U	0.00111 U	0.00222 U	0.00111 U
			8-10	0.00614 U	0.00123 U	0.00123 U	0.00614 U	0.00614 U	0.00123 U	0.0121	0.00123 U	0.00123 U	0.00123 U	0.00123 U	0.00245 U	0.00123 U	0.00245 U	0.00614 U	0.00123 U	0.00123 U	0.00123 U	0.00245 U	0.00123 U
11/13/2017	south - former Building 18-63	LAI13	1-3	0.00507 U	0.00101 U	0.00101 U	0.00507 U	0.00507 U	0.00101 U	0.0216	0.00101 U	0.00125	0.00101 U	0.00101 U	0.00203 U	0.00101 U	0.00203 U	0.00507 U	0.00101 U	0.00101 U	0.00101 U	0.00203 U	0.00101 U
			8-10	0.00702 U	0.00140 U	0.00140 U	0.00702 U	0.00702 U	0.00140 U	0.0336	0.00140 U	0.00140 U	0.00140 U	0.00140 U	0.00281 U	0.00140 U	0.00281 U	0.00702 U	0.00140 U	0.00140 U	0.00140 U	0.00281 U	0.00140 U
7/10/2018	south - former Building 18-63	LAI14	7.5-9.3	0.00666 U	0.00152	0.00133 U	0.0190	0.00666 U	0.00133 U	0.0986	0.00133 U	0.00133 U	0.00568	0.0144	0.0242	0.00133 U	0.00266 U	0.0105	0.00623	0.0313	0.00737	0.0304	0.00133 U
11/13/2017	southwest - parking lot	LAI18	1-3	0.00443 U	0.00089 U	0.00089 U	0.00443 U	0.00443 U	0.00089 U	0.0182	0.00089 U	0.00089 U	0.00089 U	0.00089 U	0.00177 U	0.00089 U	0.00177 U	0.00443 U	0.00089 U	0.00089 U	0.00089 U	0.00177 U	0.00089 U
			6-8	0.00466 U	0.00093 U	0.00093 U	0.00466 U	0.00466 U	0.00093 U	0.0203	0.00102	0.00093 U	0.00093 U	0.00093 U	0.00186 U	0.00093 U	0.00186 U	0.00466 U	0.00093 U	0.00093 U	0.00096	0.00186 U	0.00093 U
7/11/2018	west - former Building 18-24	LAI19	1.5-3	0.00526 U	0.00241	0.00115	0.00601	0.00526 U	0.00105 U	0.129	0.00105 U	0.00105 U	0.00105 U	0.00105 U	0.00211 U	0.00105 U	0.00211 U	3.17	0.00105 U	0.00105 U	0.00105 U	0.00211 U	0.00462 J
			11-13	0.00635 U	0.00127 U	0.00127 U	0.00635 U	0.00635 U	0.00127 U	0.0153	0.00127 U	0.00182	0.00127 U	0.00127 U	0.00254 U	0.00395	0.00267 U	0.0580	0.00127 U	0.00127 U	0.00127 U	0.00254 U	0.0385 J
11/14/2017	northwest - 18-59 storage	LAI21	0.3-2.3	0.00442 U	0.00088 U	0.00088 U	0.00442 U	0.00442 U	0.00088 U	0.00806	0.00088 U	0.00088 U	0.00088 U	0.00088 U	0.00177 U	0.00088 U	0.00177 U	0.00442 U	0.00088 U	0.00088 U	0.00088 U	0.00177 U	0.00088 U
			6.5-8.5	0.00651 U	0.00130 U	0.00130 U	0.00651 U	0.00651 U	0.00130 U	0.0323	0.00130 U	0.00130 U	0.00130 U	0.00130 U	0.00261 U	0.00130 U	0.00261 U	0.00651 U	0.00130 U	0.00130 U	0.00130 U	0.00261 U	0.00130 U
11/14/2017	northwest - 18-59 storage	LAI22	6.3-8.3	0.00688 U	0.00138 U	0.00138 U	0.0112	0.00688 U	0.00138 U	0.0521	0.00138 U	0.00138 U	0.00138 U	0.00138 U	0.00275 U	0.00138 U	0.00275 U	0.00688 U	0.00138 U	0.00138 U	0.00138 U	0.00275 U	0.00138 U
			10-12	0.00666 U	0.00133 U	0.00133 U	0.00666 U	0.00666 U	0.00133 U	0.0209	0.00133 U	0.00212	0.00133 U	0.00133 U	0.00266 U	0.00133 U	0.00266 U	0.00666 U	0.00133 U	0.00133 U	0.00133 U	0.00266 U	0.00133 U
7/12/2018	south - former Building 18-63	LAI31	10-11	0.00654 U	0.00131 U	0.00131 U	0.00654 U	0.00654 U	0.00131 U	0.0141	0.00131 U	0.00131 U	0.00131 U	0.00131 U	0.00262 U	0.00131 U	0.00360 U	0.00654 U	0.00131 U	0.00131 U	0.00131 U	0.00262 U	0.00131 U
7/12/2018	south - former Building 18-63	LAI32	2-3	0.00516 U	0.00103 U	0.00103 U	0.00516 U	0.00516 U	0.00103 U	0.00952	0.00103 U	0.00103 U	0.00103 U	0.00103 U	0.00206 U	0.00103 U	0.00206 U	0.00516 U	0.00103 U	0.00103 U	0.00103 U	0.00206 U	0.00103 U
			8-9	0.00697 U	0.00139 U	0.00139 U	0.00697 U	0.00697 U	0.00139 U	0.0335	0.00183	0.00139 U	0.00139 U	0.00139 U	0.00279 U	0.00139 U	0.00279 U	0.00697 U	0.00139 U	0.00139 U	0.00139 U	0.00279 U	0.00139 U
5/21/2018	north - downgradient	LAI34	1-3	0.00495 U	0.00099 U	0.00099 U	0.00495 U	0.00495 U	0.00099 U	0.0284	0.00099 U	0.00181	0.00099 U	0.00099 U	0.00198 U	0.00099 U	0.00198 U	0.00495 U	0.00099 U	0.00099 U	0.00099 U	0.00198 U	0.00099 U
			10.5-12.5	0.00618 U	0.00124 U	0.00124 U	0.00618 U	0.00618 U	0.00124 U	0.0197	0.00124 U	0.00124 U	0.00124 U	0.00124 U	0.00247 U	0.00124 U	0.00247 U	0.00618 U	0.00124 U	0.00124 U	0.00124 U	0.00247 U	0.00124 U
7/18/2018	south - former Building 18-63	LAI35	7.5-8.5	0.00704 U	0.00141 U	0.00141 U	0.00704 U	0.00704 U	0.00141 U	0.0471	0.00277	0.00345	0.00141 U	0.00141 U	0.00281 U	0.00141 U	0.00433 U	0.00704 U	0.00141 U	0.00141 U	0.00178	0.00281 U	0.00141 U
7/11/2018	west - former Building 18-24	LAI37	2.7-3.7	0.00551 U	0.00110 U	0.00110 U	0.00551 U	0.00551 U	0.00110 U	0.0351	0.00110 U	0.00110 U	0.00110 U	0.00110 U	0.00220 U	0.00110 U	0.00369	0.00815	0.00110 U	0.00110 U	0.00110 U	0.00220 U	0.00110 U
7/11/2018	west - former Building 18-24	LAI38	3-3.6	0.00528 U	0.00106 U	0.00106 U	0.00528 U	0.00733	0.00106 U	0.0593	0.00106 U	0.00106 U	0.00106 U	0.00106 U	0.00211 U	0.00106 U	0.00270	0.00528 U	0.00106 U	0.00106 U	0.00117	0.00236	0.00106 U
7/11/2018	west - former Building 18-24	LAI39	2-3	0.00506 U	0.00101 U	0.00101 U	0.00506 U	0.00506 U	0.00101 U	0.0456	0.00101 U	0.00101 U	0.00101 U	0.00101 U	0.00202 U	0.00101 U	0.00281	0.00506 U	0.00101 U	0.00101 U	0.00101 U	0.00202 U	0.00101 U
7/11/2018	west - former Building 18-24	LAI40	3-4	0.0146	0.00441	0.00192	0.0283	0.0374	0.00352	0.324	0.00119 U	0.00119 U	0.00284	0.00119 U	0.00571	0.00119 U	0.00323	0.0511	0.00329	0.00385	0.00184	0.00900	0.00628

Notes and Abbreviations
Only detected VOCs shown
No Remedial Investigation Screening Levels developed; minimum MTCA Method C Soil Screening Level shown
Bolded values are detections above MTCA Method C soil screening level
All units in milligrams per kilogram
BGS = below ground surface
VOC = volatile organic compound
U = not detected above the value shown

Sample in vicinity of former Building 18-24
Sample in vicinity of former Building 18-63

Table 6
Groundwater Results - VOCs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	Detected VOCs (µg/L)																				
			1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone /MEK	Acetone	Benzene	Carbon Disulfide	Chloromethane	*cis*-1,2-DCE	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Naphthalene	n-Propylbenzene	o-Xylene	Styrene	Tetrachloroethene	Toluene	Total Xylenes	Trichlorofluoromethane (CFC 11)	Vinyl Chloride
RI Screening Level									**0.6**			**16**									**57**			**0.02**
MTCA Method B Groundwater Screening Level			**7.68**	**7**	**--**	**80**	**4800**	**7200**	**0.8**	**800**	**--**	**16**	**700**	**800**	**1600**	**160**	**800**	**1600**	**100**	**5**	**640**	**1600**	**2400**	**2**
RI Groundwater Results																								
1/24/2017	AOC-2 - Building 18-35	SB-6	--	--	--	--	--	--	0.3	--	--	0.2	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	**0.19**
1/24/2017	AOC-2 - Building 18-35	SB-7	--	--	--	--	--	--	0.20 U	--	--	0.20 U	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	0.20 U
1/24/2017	AOC-2 - Building 18-35	SB-8	--	--	--	--	--	--	0.20 U	--	--	0.2	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	**0.19**
1/26/2017	Building 18-67 UST	SB-13	--	--	--	--	--	--	0.20 U	--	--	--	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	--
1/26/2017	Building 18-41 - KS-3	SB-17	--	--	--	--	--	--	0.20 U	--	--	--	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	--
1/27/2017	Building 18-41 - KS-3	SB-18	--	--	--	--	--	--	0.20 U	--	--	--	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	--
1/25/2017	Building 18-41 - KS-3	SB-19	--	--	--	--	--	--	0.20 U	--	--	--	0.5 U	--	--	--	--	--	--	--	0.9	0.5 U	--	--
1/27/2017	Building 18-41 - KS-3	SB-20	--	--	--	--	--	--	0.20 U	--	--	--	0.5 U	--	--	--	--	--	--	--	0.20 U	0.5 U	--	--
Due Diligence Groundwater Results																								
11/14/2017	northwest - storage	LAI1	2.00 U	2.00 U	2.00 U	2.00 U	50.0 U	50.0 U	2.00 U	2.00 U	5.00 U	2.00 U	2.00 U	2.00 U	4.00 U	5.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	6.00 U	2.00 U	2.00 U
11/14/2017	northwest - storage	LAI2	2.00 U	2.00 U	2.00 U	2.00 U	50.0 U	50.0 U	2.00 U	2.00 U	5.00 U	2.00 U	2.00 U	2.00 U	4.00 U	5.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	6.00 U	2.00 U	2.00 U
11/15/2017	north - storage	LAI3	2.00 U	2.00 U	2.00 U	2.00 U	50.0 U	50.0 U	2.00 U	2.00 U	5.00 U	2.00 U	2.00 U	2.00 U	4.00 U	5.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	6.00 U	2.00 U	2.00 U
11/15/2017	north - Building 18-43	LAI4	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/16/2017	north - parking lot	LAI5	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	northeast - Building 18-47	LAI7	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	6.95	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20	0.60 U	0.20 U	0.20 U
11/15/2017			0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/15/2017	east - parking lot	LAI9	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/15/2017	southeast - parking lot	LAI11	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/13/2017	south - former Building 18-63	LAI13	1.00 U	1.00 U	1.00 U	1.00 U	25.0 U	25.0 U	1.00 U	1.00 U	2.50 U	1.00 U	1.00 U	1.00 U	2.00 U	2.50 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	3.00 U	1.00 U	1.00 U
7/10/2018	south - former Building 18-63	LAI14	0.20 U	**36.2**	0.48	0.50	9.31	32.5	0.48	0.36	0.68	0.20 U	17.2	1.53	61.1	1.76	0.20 U	14.3	7.56	0.80	14.8	75.4	0.20 U	**7.92**
11/13/2017	southwest - parking lot	LAI16	1.00 U	1.00 U	1.00 U	1.00 U	25.0 U	25.0 U	1.00 U	1.00 U	2.50 U	1.00 U	1.00 U	1.00 U	2.00 U	2.50 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	3.00 U	1.00 U	1.00 U
11/13/2017	southwest - parking lot	LAI18	1.00 U	1.00 U	1.00 U	1.00 U	25.0 U	25.0 U	1.00 U	1.00 U	2.50 U	1.00 U	1.00 U	1.00 U	2.00 U	2.50 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	3.00 U	1.00 U	1.00 U
7/11/2018	west - former Building 18-24	LAI19	1.00 U	**8.72**	5.01	1.00 U	25.0 U	25.0 U	1.00 U	1.00 U	2.50 U	1.00 U	4.85	1.00 U	18.5	75.2	1.00 U	11.3	1.00 U	1.00 U	16.3	29.8	6.85	1.00 U
11/14/2017	northwest - 18-59 storage	LAI21	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	northwest - 18-59 storage	LAI22	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
7/12/2018	south - former Building 18-63	LAI31	0.20 U	0.20 U	4.07	1.15	5.00 U	5.00 U	0.20 U	0.20 U	1.00	0.20 U	1.84	0.20 U	12.7	0.50 U	0.36	6.77	0.20 U	0.20 U	7.04	19.4	0.20 U	**0.29**
5/21/2018	south - former Building 18-63	LAI32	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.42	0.50 U	0.20 U	0.20 U	1.15	0.75	0.66	0.20 U	0.32	0.20 U	0.20 U	0.20 U	1.07	0.20 U	**11.2**
7/12/2018			0.26	0.20 U	2.70	0.82	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	1.55	3.60	10.5	0.50 U	0.31	4.97	0.20 U	0.20 U	5.49	15.4	0.20 U	**12.6**
5/21/2018	north - downgradient	LAI34	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
7/18/2018	south - former Building 18-63	LAI35	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20	0.60 U	0.20 U	0.20 U
7/18/2018	south - former Building 18-63	LAI36	0.20 U	0.20 U	4.47	1.25	5.00 U	5.00 U	0.20 U	0.20 U	0.57	0.20 U	2.64	0.20 U	17.4	0.50 U	0.44	8.29	0.20 U	0.20 U	11.3	25.7	0.20 U	0.20 U
7/18/2018	south - former Building 18-63	LAI44	2.00 U	2.00 U	2.00 U	2.00 U	50.0 U	50.0 U	2.00 U	2.00 U	5.00 U	2.00 U	2.00 U	2.00 U	4.00 U	5.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	6.00 U	2.00 U	2.00 U
11/14/2017	north	MW1	2.00 U	2.00 U	2.00 U	2.00 U	50.0 U	50.0 U	2.00 U	2.00 U	5.00 U	2.00 U	2.00 U	2.00 U	4.00 U	5.00 U	2.00 U	2.00 U	2.00 U	2.00 U	2.00 U	6.00 U	2.00 U	2.00 U
11/14/2017	northeast	MW2	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.75	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	east	MW3	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	southeast	MW4	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	southwest	MW5	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	west	MW6	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.65	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
11/14/2017	northwest	MW7	0.20 U	0.20 U	0.20 U	0.20 U	5.00 U	5.00 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.40 U	0.50 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.60 U	0.20 U	0.20 U
Historical Groundwater Results																								
12/17/2001		18-21-1							1.0 U			1.6									1.0 U			**1.1**
10/8/2003		18-21-2							0.20 U			0.5									0.4			**0.2**
12/17/2001		18-23-1							1.0 U			6.1									1.0 U			**3.3**
12/18/2001		18-23-2							10 U			10 U									10 U			10 U
10/8/2003		18-23-3							0.20 U			0.20 U									0.20 U			0.20 U
10/8/2003		18-23-4							0.20 U			0.4									0.20 U			0.20 U
10/8/2003		18-23-5							0.20 U			0.4									0.20 U			0.20 U
10/9/2003		18-35-3							**1.8**			0.8									0.20 U			0.20 U
10/9/2003		18-35-4							0.20 U			8.7									0.20 U			**2.2**
12/17/2001		18-62-7							1.0 U			1.0 U									1.0 U			1.0 U
10/9/2003		18-62-8							0.20 U			0.20 U									0.20 U			0.20 U

Table 6
Groundwater Results - VOCs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	Detected VOCs (µg/L)																					
			1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone /MEK	Acetone	Benzene	Carbon Disulfide	Chloromethane	*cis*- 1,2-DCE	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Naphthalene	n-Propylbenzene	o-Xylene	Styrene	Tetrachloroethene	Toluene	Total Xylenes	Trichlorofluoromethane (CFC 11)	Vinyl Chloride
RI Screening Level									**0.6**			**16**									**57**			**0.02**
MTCA Method B Groundwater Screening Level			**7.68**	**7**	**--**	**80**	**4800**	**7200**	**0.8**	**800**	**--**	**16**	**700**	**800**	**1600**	**160**	**800**	**1600**	**100**	**5**	**640**	**1600**	**2400**	**2**
12/26/2001	Clearwater	BSC-18-22-01							1.0 U			1.0 U									1.0 U			1.0 U
12/26/2001		BSC-18-22-02							1.0 U			8									1.0 U			1.0 U
12/26/2001		BSC-18-22-03							**1.4**			1.0 U									1.0 U			1.0 U
12/26/2001		BSC-18-23-01							1.0 U			1.0 U									1.0 U			1.0 U
12/26/2001		BSC-18-23-02							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-62-03							1.0 U			1.0 U									1.0 U			1.0 U
12/26/2001		BSC-18-62-04							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-62-05							1.0 U			1.0 U									1.0 U			1.0 U
12/26/2001		BSC-18-62-06							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-63-01							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-63-02							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-67-02							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-67-03							1.0 U			1.0 U									1.0 U			1.0 U
12/27/2001		BSC-18-67-04							1.0 U			1.0 U									1.0 U			1.0 U
7/28/2010	Striker	KSC-DP-1							0.20 U			0.20 U									0.20 U			0.20 U
7/30/2010		KSC-DP-2							0.20 U			**23**									0.20 U			**0.3**
7/30/2010		KSC-DP-3							0.20 U			0.20 U									0.20 U			**0.2**
7/29/2010		KSC-DP-4							0.20 U			0.20 U									0.20 U			0.20 U
7/30/2010		KSC-DP-5							0.20 U			0.20 U									0.2			0.20 U
7/29/2010		KSC-DP-9							0.20 U			0.20 U									0.20 U			0.20 U
7/30/2010		KSC-DP-11							0.20 U			0.20 U									0.20 U			0.20 U
7/30/2010		KSC-DP-15							0.20 U			0.3									0.20 U			0.20 U
7/30/2010		KSC-DP-16							0.20 U			1									0.20 U			**1.8**
1/27/2011		KSC-DP-17							0.20 U			0.2									0.20 U			**0.8**
1/27/2011		KSC-DP-18							0.20 U			0.4									0.2			**1.4**
1/27/2011		KSC-DP-19							0.20 U			0.20 U									0.6			**0.2**
1/27/2011		KSC-DP-20							0.20 U			0.20 U									0.2			0.20 U

Notes and Abbreviations
Only detected VOCs shown
Only select Remedial Investigation Screening Levels developed; minimum MTCA Method B Groundwater Screening Level (or MCL if lower) additionally shown
Bolded values are detections above the RI Screening Level or MTCA screening level
VOCs = Volatile Organic Compounds
ug/L = micrograms per liter
Sample in vicinity of former Building 18-24
Sample in vicinity of former Building 18-63

Table 7
Soil Results - TPH
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Area	Sample Location ID	Sample Depth BGS (feet)	Gasoline Range Organics	Diesel Range Organics	Oil Range Organics	Gasoline Range Organics (Gx)	Diesel Range Organics	Oil Range Organics	Diesel Range Organics	Oil Range Organics
				HCID				with silica gel cleanup		without silica gel cleanup	
			RI Screening Levels	100/30	460	2000	100/30	460	2000	460	2000
RI Soil Results											
1/27/2017	AOC-1/3	SB-3	8.5-9.5	--	--	--	--	9.7 U	42 U	--	--
1/27/2017	AOC-1/3	SB-4	8-9	--	--	--	--	8.3 U	36 U	--	--
1/27/2017	AOC-1/3	SB-5	11-12	--	--	--	--	7.8 U	33 U	--	--
Due Diligence Soil Results											
11/14/2017	northwest - storage	LAI1	1-3	11 U	28 U	56 U	--	--	--	--	--
			8-10	13 U	31 U	63 U	--	--	--	--	--
11/14/2017	northwest - storage	LAI2	1-3	11 U	28 U	56 U	--	--	--	--	--
			6.3-8.3	13 U	31 U	63 U	--	--	--	--	--
11/15/2017	north - storage	LAI3	0.7-2.7	11 U	28 U	56 U	--	--	--	--	--
			5.5-7.5	14 U	35 U	70 U	--	--	--	--	--
11/15/2017	north - Building 18-43	LAI4	0.7-2.7	11 U	28 U	57 U	--	--	--	--	--
			6.7-8.7	14 U	35 U	69 U	--	--	--	--	--
11/15/2017	northeast - Building 18-47	LAI7	1-3	11 U	28 U	56 U	--	--	--	--	--
			8-10	13 U	33 U	67 U	--	--	--	--	--
11/13/2017	south - former Building 18-63	LAI13	1-3	11 U	27 U	54 U	--	--	--	--	--
			8-10	14 U	34 U	69 U	--	--	--	--	--
7/10/2018	south - former Building 18-63	LAI14	7.5-9.3	--	--	--	--	35.2	139	--	--
11/13/2017	southwest - parking lot	LAI18	1-3	11 U	28 U	132	--	--	--	9.35	83.0
			6-8	12 U	30 U	60	--	--	--	6.52	45.7
7/11/2018	west - former Building 18-24	LAI19	1.5-3	--	--	--	10.3	19.5	80.2	--	--
			11-13	--	--	--	9.37 U	6.38 U	12.8 U	--	--
11/14/2017	northwest - 18-59 storage	LAI21	0.3-2.3	11 U	27 U	55 U	--	--	--	--	--
			6.5-8.5	13 U	33 U	66 U	--	--	--	--	--
11/14/2017	northwest - 18-59 storage	LAI22	6.3-8.3	14 U	34 U	68 U	--	--	--	--	--
			10-12	14 U	35 U	145	--	--	--	10.5	85.6
7/12/2018	south - former Building 18-63	LAI32	2-3	--	--	--	--	--	--	5.08 U	10.2 U
			8-9	--	--	--	--	--	--	6.68 U	24.9
5/21/2018	north - downgradient	LAI34	1-3	13 U	32 U	65 U	--	--	--	--	--
			10.5-12.5	11 U	28 U	56 U	--	--	--	--	--
7/18/2018	south - former Building 18-63	LAI44	7-8	--	--	--	--	5.38 U	21.7	--	--
Historical Striker Data											
7/29/2010	--	KSC-DP-3	7-8	--	--	--	--	*2000*	*87*	--	--
7/29/2010	--	KSC-DP-7	3.5-4	--	--	--	--	*5.6 U*	*11 U*	--	--
7/29/2010	--	KSC-DP-8	4.5-5	--	--	--	--	*5.6 U*	*11 U*	--	--
7/29/2010	--	KSC-DP-9	5.5-6	--	--	--	--	*5.5 U*	*51*	--	--
7/30/2010	--	KSC-DP-11	5-5.5	--	--	--	--	*5.9 U*	*12 U*	--	--
7/30/2010	--	KSC-DP-13	4.5-5	--	--	--	--	*5.9 U*	*12 U*	--	--

Notes and Abbreviations

Bolded values are above Remedial Investigation Screening Level

BGS = below ground surface

TPH = Total petroleum hydrocarbons

All units in milligrams per kilogram

Italics indicate silica gel cleanup status uncertain

Sample in vicinity of former Building 18-24

Sample in vicinity of former Building 18-63

Table 8
Groundwater Results - TPH
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	Gasoline Range Organics	Diesel Range Organics	Oil Range Organics	TPH-Gasoline (Gx)	Diesel Range Organics	Oil Range Organics	Diesel Range Organics	Oil Range Organics	Mineral Oil (mg/L)
			HCID				with silica gel		without silica gel cleanup		
		RI Screening Level	--	--	--	800	500	500	500	500	500
RI Groundwater Results											
1/27/2017	AOC-1/3 - Building 18-54	SB-3	--	--	--	--	--	--	99 U	250 U	--
1/27/2017	AOC-1/3 - Building 18-54	SB-4	--	--	--	--	--	--	99 U	250 U	--
1/27/2017	AOC-1/3 - Building 18-54	SB-5	--	--	--	--	--	--	97 U	240 U	--
1/24/2017	AOC-2 - Building 18-35	SB-6	--	--	--	--	--	--	95 U	--	--
1/24/2017	AOC-2 - Building 18-35	SB-7	--	--	--	--	--	--	95 U	--	--
1/24/2017	AOC-2 - Building 18-35	SB-8	--	--	--	--	--	--	130	--	--
1/25/2017	Building 18-62 Milling	SB-9	--	--	--	--	--	--	95 U	--	200 U
1/25/2017	Building 18-62 Milling	SB-10	--	--	--	--	--	--	130	--	200 U
1/25/2017	Building 18-62 Milling	SB-11	--	--	--	--	--	--	290 J	--	325
1/25/2017	Building 18-62 Milling	SB-12	--	--	--	--	--	--	180	--	216
1/26/2017	Building 18-67 UST	SB-13	--	--	--	250 U	--	--	97 U	--	--
1/26/2017	Building 18-42 - KS-1	SB-14	--	--	--	--	--	--	250	--	--
1/26/2017	Building 18-42 - KS-1	SB-15	--	--	--	--	--	--	280	--	--
1/26/2017	Building 18-42 - KS-1	SB-16	--	--	--	--	--	--	420	--	--
1/26/2017	Building 18-41 - KS-3	SB-17	--	--	--	250 U	--	--	--	--	--
1/27/2017	Building 18-41 - KS-3	SB-18	--	--	--	250 U	--	--	--	--	--
1/25/2017	Building 18-41 - KS-3	SB-19	--	--	--	250 U	--	--	--	--	--
1/27/2017	Building 18-41 - KS-3	SB-20	--	--	--	250 U	--	--	--	--	--
5/4/2017	north	MW1	--	--	--	--	--	--	103 U	257 U	--
5/3/2017	northeast	MW2	--	--	--	--	--	--	97.6 U	244 U	--
5/3/2017	east	MW3	--	--	--	--	--	--	96.4 U	241 U	--
5/3/2017	southeast	MW4	--	--	--	--	--	--	100 UJ	250 U	--
		MW4 Duplicate	--	--	--	--	--	--	216 J	400	--
5/3/2017	southwest	MW5	--	--	--	--	--	--	103 U	257 U	--
5/4/2017	west	MW6	--	--	--	--	--	--	100 U	251 U	--
5/4/2017	northwest	MW7	--	--	--	--	--	--	99 U	248 U	--
Due Diligence Groundwater Results											
11/14/2017	northwest - storage	LAI1	250 U	500 U	1000 U	--	--	--	--	--	--
11/14/2017	northwest - storage	LAI2	250 U	500 U	1000 U	--	--	--	--	--	--
11/15/2017	north - storage	LAI3	250 U	500 U	1000 U	--	--	--	--	--	--
11/15/2017	north - Building 18-43	LAI4	250 U	500 U	1000 U	--	--	--	--	--	--
11/16/2017	north - parking lot	LAI5	250 U	500 U	1000 U	--	--	--	--	--	--

DOF

Table 8
Groundwater Results - TPH
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	Gasoline Range Organics	Diesel Range Organics	Oil Range Organics	TPH-Gasoline (Gx)	Diesel Range Organics	Oil Range Organics	Diesel Range Organics	Oil Range Organics	Mineral Oil (mg/L)
			HCID				with silica gel		without silica gel cleanup		
RI Screening Level			--	--	--	**800**	**500**	**500**	**500**	**500**	**500**
11/15/2017	northeast - Building 18-47	LAI7	--	--	--	100 U	--	--	--	--	--
11/15/2017	east - parking lot	LAI9	250 U	500 U	1000 U	--	--	--	--	--	--
11/15/2017	southeast - parking lot	LAI11	250 U	500 U	1000 U	--	--	--	--	--	--
11/13/2017	south - former Building 18-63	LAI13	250 U	500 U	1000 U	--	--	--	--	--	--
7/10/2018	south - former Building 18-63	LAI14	--	--	--	--	105	209	**1040**	**568**	--
11/13/2017	southwest - parking lot	LAI16	250 U	500 U	1000 U	--	--	--	--	--	--
11/13/2017	southwest - parking lot	LAI18	250 U	500 U	1000 U	--	--	--	--	--	--
7/11/2018	west - former Building 18-24	LAI19	--	--	--	**1470**	178	200 U	**2750**	200 U	--
11/14/2017	northwest - 18-59 storage	LAI21	250 U	500 U	1000 U	--	--	--	--	--	--
11/14/2017	northwest - 18-59 storage	LAI22	250 U	500 U	1000 U	--	--	--	--	--	--
7/12/2018	south - former Building 18-63	LAI31	--	--	--	--	100 U	200 U	100 U	200 U	--
5/21/2018	south - former Building 18-63	LAI32	250 U	**500**	1000 U	--			**729**	316	--
7/12/2018			--	--	--	--	100 U	200 U	**503**	315	--
5/21/2018	north - downgradient	LAI34	250 U	500 U	1000 U	--	--	--	--	--	--
7/18/2018	south - former Building 18-63	LAI35	--	--	--	--	100 U	200 U	100 U	200 U	--
7/12/2018	south - former Building 18-63	LAI36	--	--	--	--	100 U	200 U	100 U	200 U	--
7/18/2018	south - former Building 18-63	LAI44	--	--	--	--	100 U	200 U	**1040**	**634**	--
Historical Groundwater Sample Results											
12/17/2001	Clearwater	18-21-1	--	--	--	--	--	--	*250 U*	*500 U*	--
10/8/2003		18-21-2	--	--	--	--	--	--	*260*	*500 U*	--
12/17/2001		18-23-1	--	--	--	--	--	--	*250 U*	*500 U*	--
12/18/2001		18-23-2	--	--	--	--	--	--	***1400***	***950***	--
10/8/2003		18-23-3	--	--	--	--	--	--	*250 U*	*500 U*	--
10/8/2003		18-23-4	--	--	--	--	--	--	*250 U*	*500 U*	--
10/8/2003		18-23-5	--	--	--	--	--	--	*250 U*	*500 U*	--
12/17/2001		18-35-2	--	--	--	--	--	--	*290*	*500 U*	--
10/9/2003		18-35-3	--	--	--	--	--	--	*250 U*	*500 U*	--
10/9/2003		18-35-4	--	--	--	--	--	--	*250 U*	*500 U*	--
12/17/2001		18-62-7	--	--	--	--	--	--	*250 U*	*500 U*	--
10/9/2003		18-62-8	--	--	--	--	--	--	*250 U*	*500 U*	--
12/26/2001		BSC-18-22-01	--	--	--	--	--	--	*250 U*	*500 U*	--
12/26/2001		BSC-18-22-02	--	--	--	--	--	--	*250 U*	*500 U*	--
12/26/2001		BSC-18-22-03	--	--	--	--	--	--	*250 U*	*500 U*	--

DOF

Table 8
Groundwater Results - TPH
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	Gasoline Range Organics	Diesel Range Organics	Oil Range Organics	TPH-Gasoline (Gx)	Diesel Range Organics	Oil Range Organics	Diesel Range Organics	Oil Range Organics	Mineral Oil (mg/L)
			HCID				with silica gel		without silica gel cleanup		
RI Screening Level			--	--	--	800	500	500	500	500	500
12/26/2001		BSC-18-23-01	--	--	--	--	--	--	*250 U*	*500 U*	--
12/26/2001		BSC-18-23-02	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-62-03	--	--	--	--	--	--	*250 U*	*500 U*	--
12/26/2001		BSC-18-62-04	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-62-05	--	--	--	--	--	--	*250 U*	*500 U*	--
12/26/2001		BSC-18-62-06	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-63-01	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-63-02	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-67-02	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-67-03	--	--	--	--	--	--	*250 U*	*500 U*	--
12/27/2001		BSC-18-67-04	--	--	--	--	--	--	*250 U*	*500 U*	--
7/28/2010	Striker	KSC-DP-1	--	--	--	250 U	--	--	*100 U*	*200 U*	--
7/30/2010		KSC-DP-2	--	--	--	250 U	--	--	*100 U*	*270*	--
7/30/2010		KSC-DP-3	--	--	--	360	--	--	*110*	*200 U*	--
7/29/2010		KSC-DP-4	--	--	--	250 U	--	--	*100 U*	*200 U*	--
7/30/2010		KSC-DP-5	--	--	--	250 U	--	--	*100 U*	*200 U*	--
7/29/2010		KSC-DP-9	--	--	--	250 U	--	--	*100 U*	*200 U*	--
7/30/2010		KSC-DP-11	--	--	--	250 U	--	--	*100 U*	*200 U*	--
7/30/2010		KSC-DP-15	--	--	--	250 U	--	--	*100 U*	*200 U*	--
7/30/2010		KSC-DP-16	--	--	--	250 U	--	--	*100 U*	*200 U*	--
1/26/2011		KSC-DP-22	--	--	--	100 U	--	--	*110 U*	*220 U*	--
1/26/2011		KSC-DP-23	--	--	--	100 U	--	--	*100 U*	*210 U*	--
1/26/2011		KSC-DP-24	--	--	--	350	--	--	*110 U*	*210 U*	--
1/26/2011		KSC-DP-25b	--	--	--	380	--	--	*200*	*210 U*	--

Notes and Abbreviations

Bolded values are above Remedial Investigation Screening Level

TPH = Total petroleum hydrocarbons

All results shown in ug/L (micrograms per liter)

Italics indicate silica gel cleanup status uncertain

Sample in vicinity of former Building 18-24

Sample in vicinity of former Building 18-63

DOF

Table 9
Soil Results - SVOCs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Area	Sample Location ID	Sample Depth BGS (feet)	Detected SVOCs (mg/kg)													
				1-Methylnaphthalene	2-Methylnaphthalene	Acenaphthene	bis(2-Ethylhexyl) Phthalate	Dibenzofuran	Fluoranthene	Fluorene	Isophorone	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene	Chrysene	cPAH TEQ
MTCA Method C Soil Screening Level				**4.5E+03**	**1.4E+04**	**2.1E+05**	**9.4E+03**	**3.5E+03**	**1.4E+05**	**1.4E+05**	**1.4E+05**	**7.0E+04**	**--**	**1.1E+05**	**18**	**1.8E+04**	
RI Soil Results																	
None collected				--	--	--	--	--	--	--	--	--	--	--	--	--	--
Due Diligence Soil Results																	
11/14/2017	northwest - storage	LAI1	1-3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			8-10	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
11/14/2017	northwest - storage	LAI2	1-3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			6.3-8.3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
11/15/2017	north - storage	LAI3	0.7-2.7	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			5.5-7.5	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
11/15/2017	north - Building 18-43	LAI4	0.7-2.7	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	ND
			6.7-8.7	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	ND
11/15/2017	northeast - Building 18-47	LAI7	1-3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			8-10	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	ND
11/13/2017	south - former Building 18-63	LAI13	1-3	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	0.068 U	ND
			8-10	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
11/13/2017	southwest - parking lot	LAI18	1-3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			6-8	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	ND
7/11/2018	west - former Building 18-24	LAI19	1.5-3	0.119	0.215	0.216	0.4	0.158	0.165	0.13	0.473	0.369	0.345	0.137	0.062 U	0.079	0.00079
			11-13	0.064 U	0.064 U	0.089	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.113	0.064 U	0.064 U	0.196	0.064 U	0.196
11/14/2017	northwest - 18-59 storage	LAI21	0.3-2.3	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	ND
			6.5-8.5	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	ND
11/14/2017	northwest - 18-59 storage	LAI22	6.3-8.3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			10-12	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	0.064 U	ND
5/21/2018	north - downgradient	LAI34	1-3	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	0.062 U	ND
			10.5-12.5	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	0.065 U	ND

Notes and Abbreviations

Only detected SVOCs shown

No Remedial Investigation Screening Levels developed; minimum MTCA Method C Soil Screening Level shown

Bolded values are detections above MTCA Method C soil screening level

All units in milligrams per kilogram

BGS = below ground surface

SVOC = volatile organic compound

U = not detected above the value shown

ND = none detected

Table 10
Groundwater Results - SVOCs
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Location	Sample Location ID	SVOCs (µg/L)									
			1-Methylnaphthalene	2,4-Dimethylphenol	2-Methylnaphthalene	2-Methylphenol	4-Methylphenol	Acenaphthene	Carbazole	Dibenzofuran	Fluorene	Naphthalene
MTCA Method B Groundwater Screening Level			**1.5**	**160**	**32**	**400**	**800**	**960**	**--**	**16**	**640**	**160**
RI Groundwater Results												
None												
Due Diligence Groundwater Results												
11/14/2017	northwest - storage	LAI1	1.1 U	3.4 U	1.1 U	1.1 U	2.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
11/14/2017	northwest - storage	LAI2	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/15/2017	north - storage	LAI3	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/15/2017	north - Building 18-43	LAI4	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/16/2017	north - parking lot	LAI5	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/15/2017	east - parking lot	LAI9	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/15/2017	southeast - parking lot	LAI11	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/13/2017	south - former Building 18-63	LAI13	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/13/2017	southwest - parking lot	LAI16	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/13/2017	southwest - parking lot	LAI18	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
7/11/2018	west - former Building 18-24	LAI19	**17.3**	30.9	6.1	5.6	2.8	25.1	7.4	2.5	4.7	61.7
11/14/2017	northwest - 18-59 storage	LAI21	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
11/14/2017	northwest - 18-59 storage	LAI22	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
5/21/2018	south - former Building 18-63	LAI32	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
5/21/2018	north - downgradient	LAI34	1.0 U	3.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes and Abbreviations

No Remedial Investigation Screening Levels developed; minimum MTCA Method B (or MCL if lower) Groundwater Screening Level shown

Bolded values are detections above MTCA Method B groundwater screening level

Only detected SVOCs shown

SVOCs = Semi Volatile Organic Compounds

ug/L = micrograms per liter

Table 11
Soil Results - Metals
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Area	Sample Location ID	Sample Depth BGS (feet)	Metals (mg/kg)									
				Barium	Cadmium	Chromium	Copper	Lead	Mercury	Selenium	Silver	Zinc	Nickel
RI Screening Levels				**--**	**1**	**48**	**100**	**220**	**2**	**0.8**	**13.6**	**270**	**100**
RI Soil Results													
1/24/2017	SWMU 88/89 - Building 18-43	SB-1	11.5-12.5	--	--	24.2	37.6	6.78	--	--	0.232 U	80.3	21.7
1/24/2017	SWMU 88/89 - Building 18-43	SB-2	11.5-12.5	--	--	25.5	42.7	7.3	--	--	0.252 U	54.4	24.3
Due Diligence Soil Results													
11/14/2017	northwest - storage	LAI1	1-3	38.0	0.11 U	17.0	--	4.74	0.0296	0.55 U	0.22 U	--	--
			8-10	70.7	0.19	16.2	--	11.4	0.0953	**0.86**	0.24 U	--	--
11/14/2017	northwest - storage	LAI2	1-3	59.3	0.11 U	15.3	--	2.79	0.0217 U	0.53 U	0.21 U	--	--
			6.3-8.3	65.7	0.12 U	14.7	--	4.51	0.0616	0.61	0.23 U	--	--
11/15/2017	north - storage	LAI3	0.7-2.7	81.2	0.11 U	30.7	--	5.60	0.0382	**0.92**	0.53 U	--	--
			5.5-7.5	125	0.15 U	23.7	--	7.01	0.169	**2.40**	0.76 U	--	--
11/15/2017	north - Building 18-43	LAI4	0.7-2.7	60.1	0.11 U	29.7	--	3.74	0.0410	0.65	0.21 U	--	--
			6.7-8.7	79.9	0.35	27.8	--	22.0	0.0794	**1.09**	0.25 U	--	--
11/15/2017	northeast - Building 18-47	LAI7	1-3	56.1	0.11 U	25.8	--	4.69	0.0371	0.69	0.21 U	--	--
			8-10	69.2	0.13 U	14.8	--	3.63	0.0688	**0.95**	0.26 U	--	--
11/13/2017	south - former Building 18-63	LAI13	1-3	62.1 J	0.11 U	20.3	--	4.29	0.0404	0.54 U	0.22 U	--	--
			8-10	111	0.14 U	20.0	--	6.91	0.0797	**1.05**	0.27 U	--	--
11/13/2017	southwest - parking lot	LAI18	1-3	67.1	0.11 U	25.4	--	4.52	0.0284	0.53 U	0.21 U	--	--
			6-8	65.0	0.11 U	24.8	--	3.82	0.0346	0.55 U	0.22 U	--	--
7/11/2018	west - former Building 18-24	LAI19	1.5-3	62.3	0.15	23.7 J	--	17.1 J	0.0456	0.56 U	0.23 U	--	--
			11-13	64.6	0.13 U	16.4	--	3.64	0.0415	0.66 U	0.26 U	--	--
11/14/2017	northwest - 18-59 storage	LAI21	0.3-2.3	58.1	0.11 U	25.1	--	3.03	0.0257 U	0.53 U	0.21 U	--	--
			6.5-8.5	104	0.23	22.4	--	15.9	0.0959	**0.93**	0.25 U	--	--
11/14/2017	northwest - 18-59 storage	LAI22	6.3-8.3	89.1	0.20	22.2	--	14.6	0.113	**0.92**	0.24 U	--	--
			10-12	72.9	0.13 U	23.3	--	4.88	0.0452	**0.87**	0.26 U	--	--
5/21/2018	north - downgradient	LAI34	1-3	63.2	0.11	22.0	--	6.62	0.0382	**1.22**	0.22 U	--	--
			10.5-12.5	99.1	0.36	19.7	--	27.7	0.118	**1.60**	0.26 U	--	--
Historical Striker Data													
7/29/2010	Striker	KSC-DP-3	7-8			28	20.1	4				42	--
7/29/2010		KSC-DP-7	3.5-4			29	22.1	4				42	--
7/29/2010		KSC-DP-8	4.5-5			29	18.1	3				37	--
7/29/2010		KSC-DP-9	5.5-6			21	15.4	2				28	--
7/30/2010		KSC-DP-11	5-5.5			10.9	16.4	3				25	--
7/30/2010		KSC-DP-13	4.5-5			14.3	20.3	5				29	--

Notes and Abbreviations
Bolded values are above Remedial Investigation Screening Level
BGS = below ground surface
All units in milligrams per kilogram
U = not detected above the value shown

Table 12
Groundwater Results - Metals
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Sample Location Area	Sample Location ID	Dissolved Metals (µg/L)									
			Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Copper	Nickel	Zinc
		RI Screening Level	**2000***	**0.25**	**10**	**0.5**	**0.012**	**5**	**0.3**	**3.5**	**49**	**32**
RI Groundwater Results												
1/24/2017	SWMU 88/89 - Building 18-43	SB-1	--	--	2 U	1 U	--	--	0.5 U	2.7	5.4	15 U
1/24/2017	SWMU 88/89 - Building 18-43	SB-2	--	--	2 U	1 U	--	--	0.5 U	2 U	18.8	15 U
5/4/2017	north	MW1	--	0.5 U	3.5	**1.4**	0.2 U	2 U	0.5 U	**39.8 J**	5.3	**35.6 J**
5/3/2017	northeast	MW2	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2 U	7.9	15 U
5/3/2017	east	MW3	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2.1	2 U	15 U
5/3/2017	southeast	MW4	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2.1	2 U	15 U
		MW4 Duplicate	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2 U	2 U	15 U
5/3/2017	southwest	MW5	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2.9	2 U	15 U
5/4/2017	west	MW6	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2 U	3.8	15 UJ
5/4/2017	northwest	MW7	--	0.5 U	2 U	1 U	0.2 U	2 U	0.5 U	2.4 J	2.5	15 UJ
Due Diligence Groundwater Results												
11/14/2017	northwest - storage	LAI2	16.7	0.100 U	2.84	0.100 U	0.100 U	1.19	0.200 U	--	--	--
11/15/2017	north - storage	LAI3	16.3	0.100 U	1.31	0.100 U	0.100 U	0.781	0.200 U	--	--	--
11/15/2017	north - Building 18-43	LAI4	15.0	0.100 U	0.958	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/16/2017	north - parking lot	LAI5	30.1	0.100 U	0.834	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/15/2017	east - parking lot	LAI9	44.1	0.100 U	1.22	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/15/2017	southeast - parking lot	LAI11	45.7	0.100 U	0.500 U	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/13/2017	south - former Building 18-63	LAI13	14.0	0.100 U	0.503	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/13/2017	southwest - parking lot	LAI16	38.0	0.100 U	0.500 U	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/13/2017	southwest - parking lot	LAI18	29.7	0.100 U	1.88	0.100 U	0.100 U	0.642	0.200 U	--	--	--
7/11/2018	west - former Building 18-24	LAI19	16.9	0.100 U	1.00 U	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
11/14/2017	northwest - 18-59 storage	LAI21	40.2	0.100 U	2.07	0.100 U	0.100 U	1.53	0.200 U	--	--	--
11/14/2017	northwest - 18-59 storage	LAI22	12.2	0.100 U	0.545	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
5/21/2018	south - former Building 18-63	LAI32	5.95	0.100 U	0.699	0.234	0.100 U	1.45	0.200 U	--	--	--
5/21/2018	north - downgradient	LAI34	9.98	0.100 U	0.500 U	0.100 U	0.100 U	0.500 U	0.200 U	--	--	--
Historical Groundwater Results												
12/17/2001	Clearwater	18-21-1	--	0.2 U	3	1 U	--	--	--	1.4	1.5	5
10/8/2003		18-21-2	--	0.3	30	7	--	--	--	21.3	45.6	61
12/17/2001		18-23-1	--	0.2 U	2	1 U	--	--	--	0.5 U	0.8	4 U
12/18/2001		18-23-2	--	--	--	--	--	--	--	--	--	--
10/8/2003		18-23-3	--	0.2 U	13	2	--	--	--	10.4	25.3	33
10/8/2003		18-23-4	--	0.2	21	6	--	--	--	15.1	35	44
10/8/2003		18-23-5	--	0.3	42	6	--	--	--	30.3	67.5	122
12/17/2001		18-35-2	--	--	--	--	--	--	--	--	--	--
10/9/2003		18-35-3	--	0.2 U	3.1	1 U	--	--	--	6.4	4.0	9
10/9/2003		18-35-4	--	0.2 U	0.5 U	1 U	--	--	--	0.8	1.5	4 U
12/17/2001		18-62-7	--	0.2 U	2	1 U	--	--	--	0.7	2.6	4 U
10/9/2003		18-62-8	--	0.2 U	0.6	1 U	--	--	--	1.1	1.5	4 U
12/26/2001		BSC-18-22-01	--	0.2 U	0.5 U	1 U	--	--	--	1.6	10.1	4 U
12/26/2001		BSC-18-22-02	--	0.2 U	2 U	1 U	--	--	--	0.8	3.6	4
12/26/2001		BSC-18-22-03	--	0.2 U	2 U	1 U	--	--	--	0.9	3.8	4 U
12/26/2001		BSC-18-23-01	--	0.2 U	2 U	1 U	--	--	--	0.6	3.7	4 U
12/26/2001		BSC-18-23-02	--	0.2 U	3	1 U	--	--	--	0.8	5.7	8
12/27/2001		BSC-18-62-03	--	0.2 U	2 U	1 U	--	--	--	0.5 U	1	4 U
12/26/2001		BSC-18-62-04	--	0.2 U	0.5 U	1 U	--	--	--	0.5 U	1	4 U
12/27/2001		BSC-18-62-05	--	0.2 U	0.5 U	1 U	--	--	--	3.2	4.1	4 U

Table 12
Groundwater Results - Metals
Remedial Investigation Addendum 2
Boeing Kent Space Center

Sample Date	Sample Location Area	Sample Location ID	Dissolved Metals (µg/L)									
			Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver	Copper	Nickel	Zinc
		RI Screening Level	**2000***	**0.25**	**10**	**0.5**	**0.012**	**5**	**0.3**	**3.5**	**49**	**32**
12/26/2001		BSC-18-62-06	--	0.2 U	0.5 U	1 U	--	--	--	0.6	1.6	4 U
12/27/2001		BSC-18-63-01	--	0.2 U	2 U	1 U	--	--	--	0.5 U	0.5 U	4 U
12/27/2001		BSC-18-63-02	--	0.2 U	2 U	1 U	--	--	--	0.5 U	1	4 U
12/27/2001		BSC-18-67-02	--	0.2 U	2 U	1 U	--	--	--	0.9	1.4	4 U
12/27/2001		BSC-18-67-03	--	0.2 U	2 U	1 U	--	--	--	0.6	2.4	4 U
12/27/2001		BSC-18-67-04	--	0.2 U	2 U	1 U	--	--	--	0.8	1.7	4 U
7/28/2010	Striker	KSC-DP-1	--	0.2 U	1 U	1 U	0.1 U	--	--	0.5 U	--	4 U
7/30/2010		KSC-DP-2	--	2 U	5 U	20 U	0.1 U	--	--	2 U	--	10 U
7/30/2010		KSC-DP-3	--	2 U	5 U	20 U	0.1 U	--	--	2 U	--	10 U
7/29/2010		KSC-DP-4	--	0.2 U	1 U	1 U	0.1 U	--	--	0.5	--	4 U
7/30/2010		KSC-DP-5	--	2 U	5 U	20 U	0.1 U	--	--	2 U	--	10 U
7/29/2010		KSC-DP-9	--	0.2 U	2	1 U	0.1 U	--	--	0.8	--	4 U
7/30/2010		KSC-DP-11	--	2 U	5 U	20 U	0.1 U	--	--	2 U	--	10 U
7/30/2010		KSC-DP-15	--	2 U	5 U	20 U	0.1 U	--	--	2 U	--	10 U
7/30/2010		KSC-DP-16	--	2 U	5 U	20 U	0.1 U	--	--	2 U	--	10 U

Notes and Abbreviations

Bolded values are above Remedial Investigation Screening Level

* indicates value is MTCA Method B Groundwater Screening level; no level accounted for in RI

U = not detected above the value shown

Table 13
Planned Stormsystem Baseline Soil Data
Remedial Investigation Addendum 2
Boeing Kent Space Center

Analyte	RI Screeing Level	Sample Location, Sample Depth, Sample Date																
		BD1	BD2	TD1	TD1	TD1	TD2	TD2	TD2	TD3	TD3	TD3	TE1	TE1	TE2	TE2	TE3	TE3
		0 ft	0 ft	0.5 ft	7 ft	9 ft	0 ft	7 ft	9 ft	0.5 ft	9 ft	11 ft	0.5 ft	4 ft	0.5 ft	4 ft	0.5 ft	4 ft
		0.3 ft	0.3 ft	1.5 ft	8 ft	10 ft	1 ft	8 ft	10 ft	1.5 ft	10 ft	12 ft	1.5 ft	5 ft	1.5 ft	5 ft	1.5 ft	5 ft
		7/20/2018	7/20/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018	7/18/2018
Total Metals (mg/kg)																		
Arsenic	7.3	3.58	2.53	2.85	6.49	1.96	3.22	2.92	4.12	4.05	2.62	3.31	5.90	1.53	4.23	2.21	5.00	1.85
Barium	NA	58.8	41.8	65.8	60.2 J	34.4	59.7	47.2	49.2	81.2	57.1	71.5	104	44.9	69.5	45.4	70.1	65.6
Cadmium	0.69	0.12 U	0.10 U	0.12 U	0.27	0.12 U	0.10 U	0.14 U	0.14 U	0.10 U	0.13 U	0.14 U	0.45	0.13 U	0.11	0.11 U	0.11 U	0.13 U
Chromium, Total	42	16.1	11.1	23.5	16.1 J	10.6	**56.4 J-**	13.8	14.9	27.3	14.0	16.1	22.3	11.8	15.3	12.7	15.2	15.0
Copper	400	21.8	16.5	20.7	25.0	11.7	22.0	17.8	19.1	20.9	22.7	25.9	33.0	14.1	24.6	15.8	30.1	24.9
Lead	220	4.57	2.69	3.39	11.9	2.09	4.51	2.32	2.40	3.65	2.92	3.46	38.4	18.9	3.79	1.99	4.03	2.91
Mercury	2.09	0.0515	0.0408	0.0280 U	0.0513	0.0307 U	0.0263 U	0.0313 U	0.0355 U	0.0225 U	0.0548	0.0370	0.0445	0.0907	0.0395	0.0333	0.0347	0.0396
Selenium	0.8	0.61 U	0.52 U	0.62 U	0.72	0.68	0.51 U	0.73	**0.82**	0.52 U	**0.90**	**1.01**	0.73	0.64 U	0.75	0.64	0.85	**0.89**
Zinc	3,200	34.1	28.0	39.3	46.9	23.2	41.6	27.7	29.5	43.4	29.9	37.7	83.6	21.8	36.2	25.9	35.7	29.1
Petroleum Hydrocarbons (mg/kg)																		
Gasoline-Range Organics	30	--	--	5.6 UJ	--	--	5.87 UJ	--	--	5.36 UJ	--	--	5.38 UJ	--	5.74 UJ	--	5.46 UJ	--
Diesel-Range Organics (no silica gel)	460	--	--	5.50 U	--	--	6.05 U	--	--	5.22 U	--	--	12.3	--	5.71 U	--	5.83 U	--
Oil-Range Organics (no silica gel)	2,000	--	--	11.0 U	--	--	12.1 U	--	--	10.4 U	--	--	51.5	--	11.4 U	--	11.7 U	--
Diesel-Range Organics (with silica gel)	460	6.17 U	5.31 U	--	6.39 U	6.30 U	--	6.61 U	7.85 U	--	6.33 U	6.73 U	--	5.87 U	--	6.43 U	--	6.42 U
Oil-Range Organics (with silica gel)	2,000	12.3 U	10.6 U	--	12.8 U	12.6 U	--	13.2 U	17.0	--	12.7 U	13.5 U	--	11.7 U	--	12.9 U	--	12.8 U
PAHs (mg/kg)																		
2-Methylnaphthalene		0.00474 U	0.00481 U	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Benzo(a)anthracene		0.00526	0.00481 U	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Benzo(a)pyrene		0.00729	0.00481 U	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Benzo(b)fluoranthene		0.0105	0.00481 U	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Benzo(g,h,i)perylene		0.0113	0.00528	--	0.00508	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Benzo(J)fluoranthene		0.00474 U	0.00481 U	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Benzo(k)fluoranthene		0.00516	0.00481 U	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Chrysene		0.0105	0.00488	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Dibenzo(a,h)anthracene		0.0117	0.0108	--	0.0116	0.0111	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Fluoranthene		0.0154	0.00604	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Indeno(1,2,3-cd)pyrene		0.0163	0.0125	--	0.0123	0.0107	--	0.00497 U	0.00493 U	--	0.00971	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Phenanthrene		0.00813	0.00496	--	0.00490 U	0.00481 U	--	0.00497 U	0.00497	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Pyrene		0.0124	0.00567	--	0.00490 U	0.00481 U	--	0.00497 U	0.00493 U	--	0.00484 U	0.00482 U	--	0.00487 U	--	0.00496 U	--	0.00495 U
Total Benzofluoranthenes		0.0211	0.00963 U	--	0.00980 U	0.00962 U	--	0.00993 U	0.00986 U	--	0.00968 U	0.00964 U	--	0.00974 U	--	0.00992 U	--	0.00989 U
cPAH TEQ		NC	NC	--	0.00239	0.00218	--	ND	ND	--	0.000971	ND	--	ND	--	ND	--	ND
Total PAHs	17	0.13504	0.05013	--	NC	NC	--	NC	NC	--	NC	NC	--	NC	--	NC	--	NC
PCBs (mg/kg)																		
Aroclor 1254		0.0039 U	0.0038 U	0.0039 U	0.0040 U	0.0039 U	0.0038 U	0.0039 U	0.0039 U	0.0040 U	0.0040 U	0.0040 U	0.0056	0.0039 U	0.0038 U	0.0040 U	0.0039 U	0.0040 U
Aroclor 1260		0.0039 U	0.0038 U	0.0039 U	0.0040 UJ	0.0039 UJ	0.0038 U	0.0039 UJ	0.0039 UJ	0.0040 U	0.0040 UJ	0.0040 UJ	0.0060	0.0039 UJ	0.0038 U	0.0040 UJ	0.0039 U	0.0040 UJ
Total PCBs	0.11	0.0039 U	0.0038 U	0.0039 U	0.0040 UJ	0.0039 UJ	0.0038 U	0.0039 UJ	0.0039 UJ	0.0040 U	0.0040 UJ	0.0040 UJ	0.0116	0.0039 UJ	0.0038 U	0.0040 UJ	0.0039 U	0.0040 UJ

Notes:
U = The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
J = The result is an estimated quantity.
Data provided by Landau Associates
Bold = detected compound above RI screening level

Abbreviations and Acronyms:
ft = feet
mg/kg = milligrams per kilogram
-- = not analyzed
NA = not applicable
NC = Not Calculated

Table 14
Soil Gas Analytical Results
Remedial Investigation Addendum 2
Boeing Kent Space Center

Analyte	Screening Method C Industrial	Former Building 18-24 Area								
		LAI19 12/7/2017	LAI19 5/23/2018	LAI19 7/16/2018	LAI20 12/7/2017	LAI20 5/23/2018	LAI37 7/16/2018	LAI38 7/16/2018	LAI39 7/16/2018	LAI40 7/16/2018
Volatile Organic Compounds (µg/m3; TO-15)										
1,1,1-Trichloroethane	170,000	12 U	940 U	820 U	5.5 U	6.3 U	31 U	130 U	6.5 U	90 U
1,1,2-Trichlorotrifluoroethane	1,000,000	16 U	1300 U	1100 U	7.8 U	8.9 U	44 U	180 U	9.1 U	130 U
1,2,4-Trimethylbenzene	233	**16**	850 U	740 U	**9.2**	**5.7**	**75**	**730**	5.8 U	**140**
1,3,5-Trimethylbenzene	NL	**16**	850 U	740 U	5.0 U	5.7 U	**45**	**1400**	5.8 U	81 U
1,3-Butadiene	28	4.7 U	380 U	330 U	2.2 U	2.6 U	13 U	54 U	2.6 U	36 U
1,3-Dichlorobenzene	NL	13 U	1000 U	900 U	6.1 U	7.0 U	34 U	140 U	7.2 U	99 U
1,4-Dichlorobenzene	76	13 U	1000 U	900 U	6.1 U	7.0 U	34 U	140 U	7.2 U	99 U
2,2,4-Trimethylpentane	NL	9.9 U	810 U	700 U	**40**	**68**	27 U	110 U	5.6 U	77 U
2-Butanone/MEK	170,000	**31**	2000 U	1800 U	12 U	14 U	68 U	290 U	14 U	190 U
4-Ethyltoluene	NL	**14**	850 U	740 U	**7.9**	5.7 U	**49**	**750 J**	5.8 U	**100**
Acetone	NL	**470**	4100 U	3600 U	24 U	**44**	140 U	**730**	28 U	390 U
Benzene	107	6.8 U	550 U	480 U	**10**	**23**	18 U	77 U	3.8 U	**120**
Carbon Disulfide	23,000	26 U	2200 U	1900 U	**24**	**120**	72 U	300 U	15 U	200 U
Carbon Tetrachloride	139	13 U	1100 U	940 U	6.4 U	7.3 U	36 U	150 U	7.5 U	100 U
Chloroform	36	10 U	840 U	730 U	5.0 U	5.7 U	**34**	120 U	5.8 U	80 U
Cyclohexane	NL	7.3 U	600 U	520 U	**43**	**33**	20 U	83 U	4.1 U	**120**
Dichlorodifluoromethane	3,300	**16**	**1000**	**990**	5.0 U	5.7 U	28 U	120 U	**180**	82 U
Ethanol	NL	16 U	1300 U	1100 U	7.6 U	8.7 U	43 U	**2700**	9.0 U	120 U
Ethylbenzene	33,000	**12**	**930**	**840**	**5.9**	5.0 U	**43**	**180**	5.2 U	**340**
Isopropanol	NL	21 U	1700 U	1500 U	10 U	11 U	56 U	240 U	12 U	160 U
Isopropylbenzene	13,000	10 U	850 U	740 U	5.0 U	**9.4**	28 U	120 U	5.8 U	81 U
m,p-Xylene	NL	**23**	**2600**	**1300**	**12**	5.0 U	**96**	**290**	5.2 U	**630**
n-Heptane	NL	8.7 U	710 U	610 U	**7.6**	**6.1**	24 U	99 U	4.9 U	**120**
n-Hexane	23,000	7.5 U	610 U	530 U	**13**	**8.1**	20 U	85 U	4.2 U	**200**
n-Propylbenzene	NL	10 U	850 U	740 U	5.0 U	5.7 U	28 U	120 U	5.8 U	81 U
o-Xylene	3,300	**16**	**820**	650 U	**11**	**9.4**	**62**	**550**	5.2 U	**310**
Styrene	33,000	9.0 U	740 U	640 U	4.3 U	4.9 U	24 U	100 U	5.1 U	**290**
Tetrachloroethene	1,300	**15**	1200 U	1000 U	**16**	**28**	**41**	160 U	**16**	110 U
Tetrahydrofuran	NL	6.2 U	510 U	440 U	3.0 U	3.4 U	17 U	72 U	3.5 U	49 U
Toluene	170,000	**9.4**	**5700**	**3500 J**	**15**	4.4 U	22 U	91 U	4.5 U	**320**
Trichloroethene	67	11 U	930 U	810 U	5.4 U	6.2 U	**39**	130 U	6.4 U	**92**
Trichlorofluoromethane (CFC 11)	23,000	**3300**	**220000**	**210000**	**26**	**25**	**3100**	**32000**	**2000**	**23000**
Vinyl Chloride	93	5.4 U	440 U	380 U	2.6 U	3.0 U	15 U	62 U	3.0 U	42 U

Notes:
U = The compound was not detected at the reported concentration.
Bold text indicates detected analyte.
Grey Box indicates above MTCA Method C soil gas screening level
NL = not listed
µg/m^3 = micrograms per cubic meter

Table 14
Soil Gas Analytical Results
Remedial Investigation Addendum 2
Boeing Kent Space Center

Analyte	Screening Method C Industrial	Former Building 18-63 Area														
		LAI13 12/6/2017	LAI13 7/16/2018	LAI14 12/7/2017	LAI14 7/16/2018	LAI16 12/6/2017	LAI30 5/23/2018	LAI31 5/23/2018	LAI31 7/16/2018	LAI32 5/23/2018	LAI32 7/16/2018	LAI33 5/23/2018	LAI35 7/20/2018	LAI36 7/16/2018	LAI3 12/6/2017	LAI6 12/6/2017
Volatile Organic Compounds (µg/m3; TO-15)																
1,1,1-Trichloroethane	170,000	5.9 U	6.7 U	23 U	70 U	5.9 U	6.3 U	6.4 U	7.3 U	6.4 U	27 U	6.3 U	6.5 U	6.5 U	5.8 U	5.8 U
1,1,2-Trichlorotrifluoroethane	1,000,000	8.3 U	9.4 U	32 U	99 U	8.2 U	**8.9**	8.9 U	10 U	9.0 U	38 U	8.8 U	9.1 U	9.1 U	8.2 U	8.2 U
1,2,4-Trimethylbenzene	233	5.3 U	6.0 U	21 U	63 U	5.3 U	**16**	**21**	6.6 U	**25**	24 U	5.7 U	5.8 U	5.8 U	5.2 U	5.2 U
1,3,5-Trimethylbenzene	NL	5.3 U	6.0 U	21 U	63 U	5.3 U	**7.9**	**7.8**	6.6 U	**42**	24 U	5.7 U	5.8 U	5.8 U	5.2 U	5.2 U
1,3-Butadiene	28	2.4 U	2.7 U	**24**	28 U	2.4 U	2.5 U	**180**	3.0 U	2.6 U	11 U	2.6 U	2.6 U	2.6 U	**4.2**	**29**
1,3-Dichlorobenzene	NL	6.5 U	7.4 U	25 U	78 U	6.5 U	**25**	**34**	**8.0**	**34**	**71**	**26**	7.1 U	7.2 U	6.4 U	6.4 U
1,4-Dichlorobenzene	76	6.5 U	7.4 U	25 U	78 U	6.5 U	6.9 U	7.0 U	8.1 U	7.1 U	30 U	6.9 U	7.1 U	7.2 U	6.4 U	6.4 U
2,2,4-Trimethylpentane	NL	5.1 U	5.7 U	20 U	60 U	5.0 U	5.4 U	5.4 U	6.3 U	**26**	**32**	5.4 U	5.5 U	5.6 U	**41**	5.0 U
2-Butanone/MEK	170,000	13 U	14 U	50 U	150 U	13 U	**15**	**25**	16 U	**490**	**100**	14 U	**15**	14 U	12 U	12 U
4-Ethyltoluene	NL	5.3 U	6.0 U	**21**	63 U	5.3 U	**28**	**36**	6.6 U	**42**	24 U	5.7 U	5.8 U	5.8 U	5.2 U	5.2 U
Acetone	NL	26 U	**97**	**100**	**330**	26 U	**80**	**110**	32 U	**59**	120 U	**67**	**65**	28 U	25 U	25 U
Benzene	107	3.5 U	3.9 U	**170**	**310**	3.4 U	**38**	**170**	4.3 U	**30**	**20**	3.7 U	**9.3**	3.8 U	**58**	**12**
Carbon Disulfide	23,000	14 U	15 U	52 U	160 U	13 U	**73**	**120**	17 U	**28**	61 U	14 U	**120**	15 U	13 U	**24**
Carbon Tetrachloride	139	6.8 U	7.7 U	**65**	81 U	6.8 U	7.2 U	7.3 U	8.5 U	**10**	31 U	7.3 U	7.4 U	7.5 U	6.7 U	6.7 U
Chloroform	36	5.3 U	6.0 U	**25**	63 U	5.2 U	**160**	**77**	6.6 U	**26**	24 U	5.6 U	**33**	5.8 U	5.2 U	**7.1**
Cyclohexane	NL	3.7 U	4.2 U	**34**	**96**	3.7 U	**38**	**73**	4.6 U	**91**	**110**	**13**	4.1 U	4.1 U	**35**	**8.0**
Dichlorodifluoromethane	3,300	5.4 U	6.1 U	**34**	64 U	5.3 U	5.7 U	5.8 U	6.6 U	5.8 U	24 U	5.7 U	5.9 U	5.9 U	5.3 U	5.3 U
Ethanol	NL	8.2 U	**34**	32 U	97 U	8.1 U	**12**	8.8 U	10 U	8.8 U	37 U	**21**	8.9 U	**21**	8.0 U	8.0 U
Ethylbenzene	33,000	4.7 U	5.3 U	18 U	**130**	4.7 U	**15**	**45**	5.8 U	**86**	**34**	5.0 U	5.1 U	5.2 U	4.6 U	4.6 U
Isopropanol	NL	11 U	12 U	41 U	130 U	10 U	11 U	11 U	13 U	12 U	48 U	11 U	12 U	12 U	10 U	10 U
Isopropylbenzene	13,000	5.3 U	6.0 U	**54**	**230**	5.3 U	5.6 U	**6.2**	6.6 U	**240**	**110**	5.7 U	5.8 U	5.8 U	5.2 U	5.2 U
m,p-Xylene	NL	4.7 U	5.3 U	**44**	**150**	4.7 U	**47**	**89**	5.8 U	**170**	**45**	5.0 U	**14**	**5.3**	4.6 U	4.6 U
n-Heptane	NL	4.4 U	5.0 U	**30**	**81**	4.4 U	**36**	**230**	5.5 U	**62**	**71**	4.7 U	**7.5**	4.9 U	**8.4**	**9.7**
n-Hexane	23,000	3.8 U	4.3 U	**110**	**360**	3.8 U	**58**	**270**	4.7 U	**130**	**150**	**18**	**8.0**	4.2 U	**43**	**62**
n-Propylbenzene	NL	5.3 U	6.0 U	21 U	63 U	5.3 U	**6.6**	**11**	6.6 U	**9.9**	24 U	5.7 U	5.8 U	5.8 U	5.2 U	5.2 U
o-Xylene	3,300	4.7 U	5.3 U	**51**	**160**	4.7 U	**17**	**35**	5.8 U	**150**	**52**	5.0 U	5.1 U	5.2 U	4.6 U	4.6 U
Styrene	33,000	4.6 U	5.2 U	**20**	**160**	4.6 U	4.9 U	**18**	5.7 U	**120**	21 U	4.9 U	5.0 U	5.1 U	4.5 U	4.5 U
Tetrachloroethene	1,300	7.4 U	8.3 U	28 U	88 U	7.3 U	7.8 U	7.9 U	9.1 U	**12**	33 U	7.8 U	8.0 U	8.1 U	7.2 U	7.2 U
Tetrahydrofuran	NL	3.2 U	3.6 U	12 U	38 U	3.2 U	3.4 U	3.4 U	4.0 U	3.5 U	14 U	3.4 U	3.5 U	3.5 U	3.1 U	3.1 U
Toluene	170,000	4.1 U	**5.4**	**97**	**230**	**7.1**	**48**	**190**	5.1 U	**94**	**60**	4.4 U	**23**	4.5 U	**57**	**15**
Trichloroethene	67	5.8 U	6.6 U	23 U	69 U	5.8 U	6.2 U	6.3 U	7.2 U	**12**	26 U	6.2 U	6.4 U	6.4 U	5.7 U	5.7 U
Trichlorofluoromethane (CFC 11)	23,000	6.1 U	6.9 U	**950**	**3000**	6.0 U	6.5 U	6.5 U	**9.8**	**620**	**610**	6.5 U	**24**	**9.2**	6.0 U	6.0 U
Vinyl Chloride	93	2.8 U	3.1 U	11 U	33 U	2.7 U	2.9 U	3.0 U	3.4 U	**7.3**	12 U	3.0 U	3.0 U	3.0 U	2.7 U	2.7 U

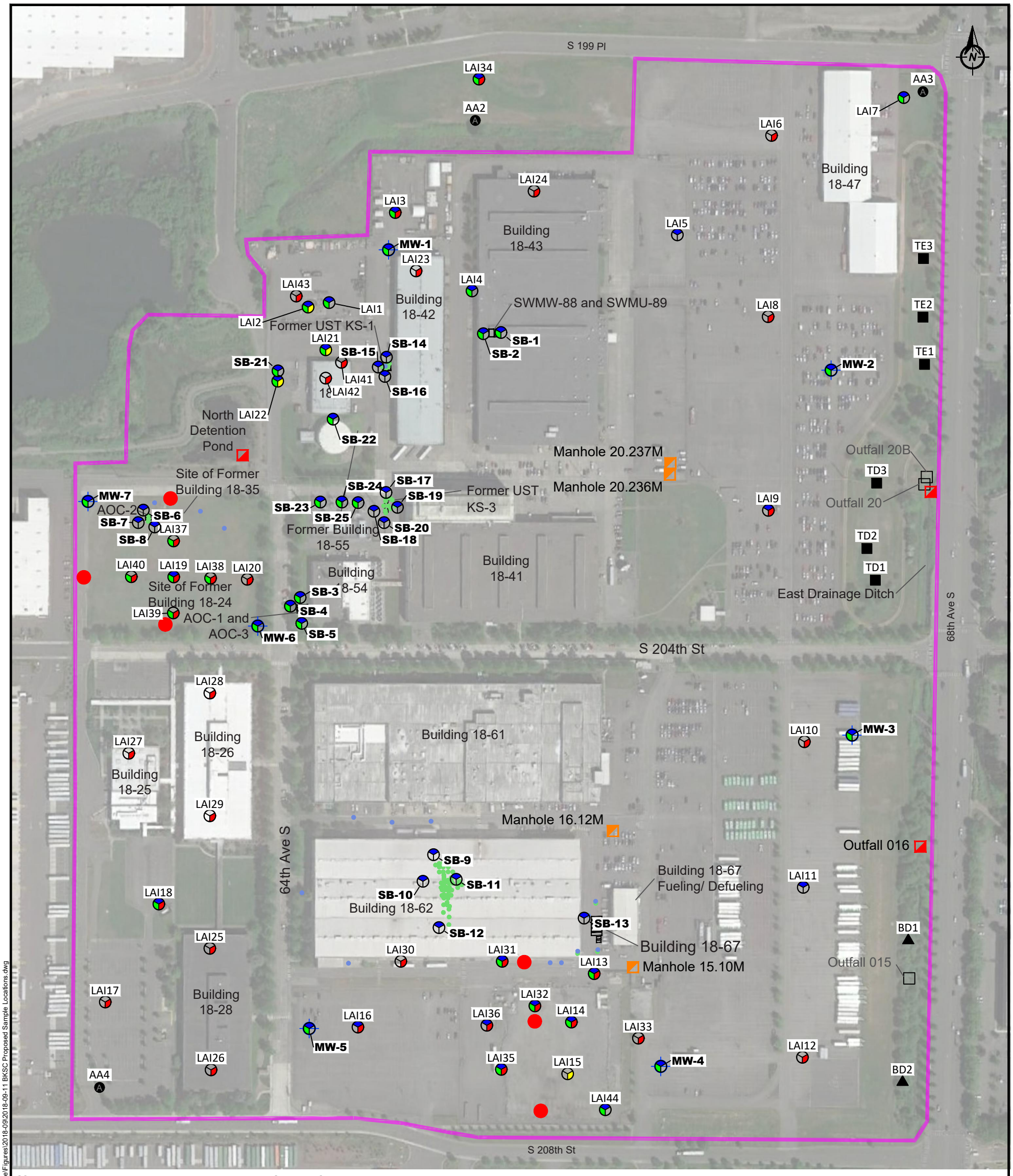
Table 14
Soil Gas Analytical Results
Remedial Investigation Addendum 2
Boeing Kent Space Center

Analyte	Screening Method C Industrial	LAI8 5/23/2018	LAI9 12/6/2017	LAI10 12/6/2017	LAI12 5/23/2018	LAI17 12/6/2017	LAI18 12/6/2017	LAI23 12/20/2017	LAI23 1/30/2018	LAI23 5/23/2018	LAI24 12/7/2017	LAI25 12/6/2017	LAI26 12/6/2017	LAI27 12/20/2017	LAI27 1/30/2018	LAI27 5/23/2018
Volatile Organic Compounds (µg/m3; TO-15)																
1,1,1-Trichloroethane	170,000	6.5 U	5.5 U	5.3 U	6.2 U	6.2 U	6.3 U	5.9 U	6.4 U	6.5 U	6.1 U	5.8 U	5.8 U	6.3 U	6.2 U	6.5 U
1,1,2-Trichlorotrifluoroethane	1,000,000	9.1 U	7.7 U	7.5 U	8.7 U	8.7 U	8.8 U	8.3 U	8.9 U	9.2 U	**23**	8.2 U	8.2 U	8.8 U	8.7 U	9.1 U
1,2,4-Trimethylbenzene	233	**32**	4.9 U	4.8 U	**48**	5.6 U	5.6 U	**6.2**	5.7 U	5.9 U	5.5 U	5.2 U	5.2 U	5.7 U	5.6 U	5.8 U
1,3,5-Trimethylbenzene	NL	**13**	4.9 U	4.8 U	**23**	5.6 U	5.6 U	5.3 U	5.7 U	5.9 U	5.5 U	5.2 U	5.3 U	5.7 U	5.6 U	5.8 U
1,3-Butadiene	28	2.6 U	2.2 U	2.2 U	2.5 U	2.5 U	2.5 U	2.4 U	2.6 U	2.6 U	2.5 U	2.4 U	2.4 U	2.6 U	2.5 U	2.6 U
1,3-Dichlorobenzene	NL	**16**	6.0 U	5.9 U	**44**	6.8 U	6.9 U	6.5 U	7.0 U	7.2 U	6.7 U	6.4 U	6.4 U	6.9 U	6.8 U	7.2 U
1,4-Dichlorobenzene	76	7.2 U	6.0 U	5.9 U	6.8 U	6.8 U	6.9 U	**250**	**7.6**	7.2 U	6.7 U	6.4 U	**7.4**	**190**	**23**	7.2 U
2,2,4-Trimethylpentane	NL	5.6 U	**12**	**7.2**	5.3 U	5.3 U	**9.8**	5.0 U	5.4 U	5.6 U	5.2 U	5.0 U	5.0 U	5.4 U	5.3 U	5.6 U
2-Butanone/MEK	170,000	**17**	12 U	12 U	13 U	13 U	14 U	**26**	14 U	14 U	13 U	12 U	13 U	**16**	13 U	14 U
4-Ethyltoluene	NL	**36**	4.9 U	4.8 U	**60**	5.6 U	5.6 U	**5.4**	5.7 U	5.9 U	5.5 U	5.2 U	5.3 U	5.7 U	5.6 U	5.8 U
Acetone	NL	**48**	24 U	23 U	27 U	**51**	27 U	**150**	28 U	28 U	27 U	25 U	25 U	**99**	27 U	28 U
Benzene	107	**12**	3.2 U	3.1 U	3.6 U	3.6 U	**7.3**	**5.3**	3.7 U	3.8 U	3.6 U	3.4 U	3.4 U	**4.9**	3.6 U	3.8 U
Carbon Disulfide	23,000	15 U	12 U	12 U	14 U	14 U	**41**	**18**	14 U	15 U	14 U	13 U	13 U	14 U	14 U	15 U
Carbon Tetrachloride	139	7.5 U	6.3 U	6.1 U	7.2 U	7.2 U	7.2 U	6.8 U	7.3 U	7.5 U	7.0 U	6.7 U	6.7 U	7.3 U	7.1 U	7.5 U
Chloroform	36	**20**	4.9 U	4.8 U	**10**	5.6 U	5.6 U	5.3 U	5.7 U	5.8 U	5.5 U	5.2 U	5.2 U	5.6 U	5.5 U	5.8 U
Cyclohexane	NL	**33**	**8.7**	**27**	3.9 U	**6.7**	**19**	3.7 U	4.0 U	4.1 U	3.8 U	3.7 U	3.7 U	4.0 U	3.9 U	4.1 U
Dichlorodifluoromethane	3,300	5.9 U	5.0 U	4.8 U	5.6 U	5.6 U	5.7 U	5.3 U	5.8 U	5.9 U	5.5 U	5.3 U	5.3 U	5.7 U	5.6 U	5.9 U
Ethanol	NL	**11**	7.6 U	7.3 U	**15**	8.6 U	8.7 U	**21**	**16 J**	9.0 U	8.4 U	8.0 U	8.1 U	**22**	8.5 UJ	9.0 U
Ethylbenzene	33,000	**16**	4.4 U	4.2 U	4.9 U	4.9 U	5.0 U	4.7 U	5.0 U	5.2 U	4.9 U	4.6 U	4.6 U	**5.4**	4.9 U	5.2 U
Isopropanol	NL	12 U	9.9 U	9.6 U	11 U	11 U	11 U	11 U	11 U	12 U	11 U	10 U	10 U	11 U	11 U	12 U
Isopropylbenzene	13,000	5.8 U	4.9 U	4.8 U	5.6 U	5.6 U	5.6 U	5.3 U	5.7 U	5.9 U	5.5 U	5.2 U	5.2 U	5.7 U	5.6 U	5.8 U
m,p-Xylene	NL	**32**	4.4 U	4.2 U	**21**	5.0 U	**8.2**	**18**	5.0 U	5.2 U	4.9 U	4.6 U	**7.8**	**16**	**5.2**	5.2 U
n-Heptane	NL	**35**	4.1 U	4.0 U	**7.6**	4.7 U	**45**	4.4 U	4.8 U	4.9 U	4.6 U	4.4 U	4.4 U	4.7 U	4.6 U	4.9 U
n-Hexane	23,000	**95**	3.5 U	**15**	**16**	**5.4**	**150**	3.8 U	4.1 U	4.2 U	3.9 U	3.8 U	3.8 U	**5.7**	4.0 U	4.2 U
n-Propylbenzene	NL	**6.2**	4.9 U	4.8 U	**11**	5.6 U	5.6 U	5.3 U	5.7 U	5.9 U	5.5 U	5.2 U	5.3 U	5.7 U	5.6 U	5.8 U
o-Xylene	3,300	**14**	4.4 U	4.2 U	**8.7**	5.0 U	5.0 U	**5.9**	5.0 U	5.2 U	4.9 U	4.6 U	4.6 U	**5.4**	4.9 U	5.2 U
Styrene	33,000	5.1 U	4.3 U	4.2 U	4.8 U	4.8 U	4.9 U	4.6 U	5.0 U	5.1 U	4.8 U	4.5 U	4.6 U	4.9 U	4.8 U	5.1 U
Tetrachloroethene	1,300	8.1 U	6.8 U	6.6 U	7.7 U	7.7 U	7.8 U	7.3 U	7.9 U	8.1 U	7.6 U	7.2 U	7.2 U	7.8 U	7.7 U	8.1 U
Tetrahydrofuran	NL	3.5 U	3.0 U	2.9 U	3.4 U	3.4 U	3.4 U	**29**	3.4 U	3.5 U	3.3 U	3.1 U	3.2 U	**26**	3.3 U	3.5 U
Toluene	170,000	**28**	3.8 U	3.7 U	**5.7**	4.3 U	**12**	**27**	4.4 U	4.5 U	4.2 U	4.0 U	4.0 U	**18**	4.2 U	4.5 U
Trichloroethene	67	6.4 U	5.4 U	5.2 U	6.1 U	6.1 U	6.2 U	5.8 U	6.3 U	6.4 U	6.0 U	5.7 U	5.8 U	6.2 U	6.1 U	6.4 U
Trichlorofluoromethane (CFC 11)	23,000	6.7 U	5.6 U	5.5 U	6.4 U	6.4 U	6.5 U	6.1 U	6.5 U	6.7 U	6.3 U	6.0 U	6.0 U	6.5 U	6.3 U	6.7 U
Vinyl Chloride	93	3.0 U	2.6 U	2.5 U	2.9 U	2.9 U	2.9 U	2.8 U	3.0 U	3.0 U	2.9 U	2.7 U	2.7 U	3.0 U	2.9 U	3.0 U

Table 14
Soil Gas Analytical Results
Remedial Investigation Addendum 2
Boeing Kent Space Center

Analyte	Screening Method C Industrial	LAI28 12/6/2017	LAI29 12/6/2017	LAI34 5/23/2018	LAI41 7/20/2018	LAI42 7/17/2018	LAI43 7/17/2018
Volatile Organic Compounds (µg/m3; TO-15)							
1,1,1-Trichloroethane	170,000	5.8 U	5.8 U	6.3 U	**9.0**	6.5 U	6.6 U
1,1,2-Trichlorotrifluoroethane	1,000,000	8.2 U	8.2 U	8.8 U	**55**	**42**	9.3 U
1,2,4-Trimethylbenzene	233	5.2 U	5.2 U	5.6 U	5.6 U	5.8 U	5.9 U
1,3,5-Trimethylbenzene	NL	5.3 U	5.3 U	5.6 U	5.6 U	5.8 U	5.9 U
1,3-Butadiene	28	2.4 U	2.4 U	2.5 U	2.5 U	2.6 U	2.7 U
1,3-Dichlorobenzene	NL	6.4 U	6.4 U	**31**	6.8 U	7.2 U	7.3 U
1,4-Dichlorobenzene	76	6.4 U	6.4 U	6.9 U	6.8 U	**8.6**	7.3 U
2,2,4-Trimethylpentane	NL	5.0 U	5.0 U	5.4 U	5.3 U	5.6 U	5.6 U
2-Butanone/MEK	170,000	13 U	13 U	14 U	13 U	14 U	14 U
4-Ethyltoluene	NL	5.3 U	5.3 U	5.6 U	5.6 U	5.8 U	5.9 U
Acetone	NL	25 U	25 U	27 U	27 U	**360**	29 U
Benzene	107	3.4 U	3.4 U	3.7 U	**8.4**	3.8 U	3.9 U
Carbon Disulfide	23,000	13 U	13 U	14 U	14 U	15 U	15 U
Carbon Tetrachloride	139	6.7 U	6.7 U	7.2 U	7.2 U	7.5 U	7.6 U
Chloroform	36	5.2 U	5.2 U	5.6 U	5.6 U	5.8 U	5.9 U
Cyclohexane	NL	3.7 U	3.7 U	4.0 U	3.9 U	4.1 U	4.2 U
Dichlorodifluoromethane	3,300	5.3 U	5.3 U	**77**	5.6 U	5.9 U	6.0 U
Ethanol	NL	8.1 U	8.1 U	8.7 U	8.6 U	**210**	**73**
Ethylbenzene	33,000	4.6 U	4.6 U	5.0 U	4.9 U	5.2 U	5.2 U
Isopropanol	NL	10 U	10 U	11 U	11 U	**86**	12 U
Isopropylbenzene	13,000	5.2 U	5.2 U	5.6 U	5.6 U	5.8 U	5.9 U
m,p-Xylene	NL	4.6 U	4.6 U	5.0 U	**16**	5.2 U	5.2 U
n-Heptane	NL	4.4 U	4.4 U	4.7 U	4.7 U	4.9 U	5.0 U
n-Hexane	23,000	3.8 U	3.8 U	4.0 U	4.0 U	4.2 U	4.3 U
n-Propylbenzene	NL	5.3 U	5.3 U	5.6 U	5.6 U	5.8 U	5.9 U
o-Xylene	3,300	4.6 U	4.6 U	5.0 U	5.0 U	5.2 U	5.2 U
Styrene	33,000	4.6 U	4.6 U	4.9 U	4.8 U	5.1 U	5.2 U
Tetrachloroethene	1,300	7.2 U	7.2 U	7.8 U	**55**	8.1 U	8.2 U
Tetrahydrofuran	NL	3.2 U	3.2 U	3.4 U	**4.4**	**54**	3.6 U
Toluene	170,000	4.0 U	4.0 U	4.3 U	4.3 U	4.5 U	**5.6**
Trichloroethene	67	5.8 U	5.8 U	6.2 U	6.1 U	6.4 U	6.5 U
Trichlorofluoromethane (CFC 11)	23,000	6.0 U	6.0 U	6.5 U	**13**	6.7 U	**8.4**
Vinyl Chloride	93	2.7 U	2.7 U	2.9 U	2.9 U	3.0 U	3.1 U

Figure



Notes

1. Bolded locations sampled as part of the RI.
2. Manhole 20.236 has previously been referred to as Manhole 20.235.
3. Tank locations are approximations. Please refer to Boeing internal documents for precise location.
4. Black and white reproduction of this color original may reduce the effectiveness and lead to incorrect interpretation.
5. Background image source is from Google Earth and is intended to be used for visual reference only. Geographic positioning is approximate - do not use for mapping.

Legend

- Proposed 2018 Sample Boring Location
- Existing Monitoring Well
- Outfall and Number
- Stormwater Conveyance System Solid and Stormwater Sample Location
- Stormwater Conveyance System Sediment and Stormwater Sampling Location
- Boeing Ditch Sample (Landau)
- Stormwater Feature Sample (Landau)
- Groundwater Sample
- Soil Sample
- Soil Gas Sample
- Soil Gas Well Installed - No Sample Collected
- Historic Water Sample
- Historic Soil Sample
- Site Boundary

0 50 150 250
Scale in Feet

Boeing Kent Space Center
Kent, Washington

Remedial Investigation

Proposed Sample Locations

DALTON OLMSTED FUGLEVAND

FIGURE 1

September 11, 2018

Boring Logs

DALTON OLMSTED FUGLEVAND

LOG OF SB-21

PROJECT: Boeing KSC RI	COORDINATES: 156866.8**N** 1288133.2**E** (NAD83)	
LOCATION: Kent, WA - West of Bldg. 18-59	SURFACE ELEVATION: 29'	
DRILLING CONTRACTOR: Holt	DATE: 5/7/18	
DRILLING EQUIPMENT: Geoprobe 7822 DT	TOTAL DEPTH OF BORING: 15.0'	
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. X 5' Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Boring cleared by airknife/vac-truck from 0-5'		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blows/Foot	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0					Washed gravel surfacing	
1	SB21-(1-3)			0.1	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): moist, gray (7.5yr - 5/1), 20% gravel, 70% sand, 10% silt	
10					SILT (ML): wet, gray (7.5YR-6/1), 100% silt, plastic	Temporary 3/4" PVC screen 0.010 slotted screen set for groundwater grab sample: KSC-SB21-GW-050718
13					POORLY GRADED SAND (SP): saturated, dark gray (7.5YR-4/1), 100% fine sand	
15					Bottom of Boring 15.0 feet Backfilled with bentonite chip.	
20						

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

DALTON OLMSTED FUGLEVAND

LOG OF SB-22

PROJECT: Boeing KSC RI	COORDINATES: 156807.2**N** 1288256.8**E** (NAD83)	
LOCATION: Kent, WA - South of Bldg. 18-59	SURFACE ELEVATION: 29'	
DRILLING CONTRACTOR: Holt	DATE: 5/7/18	
DRILLING EQUIPMENT: Geoprobe 7822 DT	TOTAL DEPTH OF BORING: 15.0'	
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. X 5' Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Boring cleared by airknife/vac-truck from 0-5'		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blows/Foot	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION (Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors)	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0					POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): moist, brown(7.5yr-5/3) with roots, 10% gravel, 20% silt, 70% sand	
1	SB22-(1-3)					
2				0.1		
3						
4						
5					POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): moist, gray (7.5yr - 5/1), 20% gravel, 70% sand, 10% silt	
6						
7						▽
8						
9						
10					SILT (ML): wet/gray 100% silt, plastic	
11						
12						
13					POORLY GRADED SAND (SP): saturated, dark gray (7.5YR-4/1), 100% fine sand	Temporary 3/4" PVC screen 0.010 slotted screen set for groundwater grab sample: KSC-SB22-GW-050718
14						
15					Bottom of Boring 15.0 feet Backfilled with bentonite chip.	
16						
17						
18						
19						
20						

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

DALTON OLMSTED FUGLEVAND

LOG OF SB-23

PROJECT: Boeing KSC RI	COORDINATES: 156596.5**N** 1288207.3**E** (NAD83)	
LOCATION: Kent, WA - West, North of Substation	SURFACE ELEVATION: 26'	
DRILLING CONTRACTOR: Holt	DATE: 5/7/18	
DRILLING EQUIPMENT: Geoprobe 7822 DT	TOTAL DEPTH OF BORING: 15.0'	
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. X 5' Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Boring cleared by airknife/vac-truck from 0-5'		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blows/Foot	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0					6-inch concrete	
1	SB23-(1-3)			0.1	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): wet, brown (7.5YR-5/3) 20% gravel, 70% sand, 10% silt	
5					SILT (ML): wet, gray (7.5YR-5/1), 100% silt, plastic	▽
10					POORLY GRADED SAND (SP): saturated, dark gray (7.5YR-4/1), 100% fine sand	Temporary 3/4" PVC screen 0.010 slotted screen set for groundwater grab sample: KSC-SB23-GW-050718
15					Bottom of Boring 15.0 feet Backfilled with bentonite chip and concrete patch.	
20						

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

DALTON OLMSTED FUGLEVAND

LOG OF SB-24

PROJECT: Boeing KSC RI	COORDINATES: 156594.5**N** 1288275.4**E** (NAD83)	
LOCATION: Kent, WA - Center, North of substation	SURFACE ELEVATION: 27'	
DRILLING CONTRACTOR: Holt	DATE: 5/7/18	
DRILLING EQUIPMENT: Geoprobe 7822 DT	TOTAL DEPTH OF BORING: 15.0'	
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. X 5' Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Boring cleared by airknife/vac-truck from 0-5'		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blows/Foot	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0					6-inch concrete	
1	SB24-(1-3)			0.1	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): moist, gray, 20% gravel, 70% sand, 10% silt	
5					- Grading siltier with depth	▽
6					SILT (ML): plastic, wet, gray (7.5YR-5/1), 100% silt	
10						Temporary 3/4" PVC screen 0.010 slotted screen set for groundwater grab sample: KSC-SB24-050718
11					POORLY GRADED SAND (SP): saturated, dark, gray (7.5YR-4/1), 100% fine sand	
15					Bottom of Boring 15.0 feet Backfilled with bentonite chip and concrete patch.	

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

DALTON OLMSTED FUGLEVAND

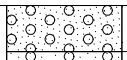
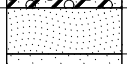
LOG OF SB-25

PROJECT: Boeing KSC RI	COORDINATES: 156596.2**N** 1288346.0**E** (NAD83)	
LOCATION: Kent, WA -East , North of Substation	SURFACE ELEVATION: 28'	
DRILLING CONTRACTOR: Holt	DATE: 5/7/18	
DRILLING EQUIPMENT: Geoprobe 7822 DT	TOTAL DEPTH OF BORING: 15.0'	
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. X 5' Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Boring cleared by airknife/vac-truck from 0-5'		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blows/Foot	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0					6-inch Concrete	
1	SB25-(1-3)			0.1	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): moist, gray (7.5YR-5/1), 20% gravel, 70% sand, 10% silt	
2						
3						
4						
5						
6					SILT (ML): plastic, wet, gray (7.5YR-6/1), 100% silt, plastic	▽
7						
8						
9						
10					wet, gray, 100% silt	Temporary 3/4" PVC screen 0.010 slotted screen set for groundwater grab sample: KSC-SB25-GW-050718
11						
12						
13					POORLY GRADED SAND (SP): dark gray (7.5YR-4/1), saturated, 100% fine sand	
14						
15					Bottom of Boring 15.0 feet Backfilled with bentonite chip and concrete patch.	
16						
17						
18						
19						
20						

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		**GW**	Well-graded gravel; gravel/sand mixture(s); little or no fines
				**GP**	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		**GM**	Silty gravel; gravel/sand/silt mixture(s)
				**GC**	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		**SW**	Well-graded sand; gravelly sand; little or no fines
				**SP**	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		**SM**	Silty sand; sand/silt mixture(s)
				**SC**	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			**ML**	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				**CL**	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				**OL**	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			**MH**	Inorganic silt; micaceous or diatomaceous fine sand
				**CH**	Inorganic clay of high plasticity; fat clay
				**OH**	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			**PT**	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		**AC** or **PC**	Asphalt concrete pavement or Portland cement pavement
ROCK		**RK**	Rock (See Rock Classification)
WOOD		**WD**	Wood, lumber, wood chips
DEBRIS		**DB**	Construction debris, garbage

NOTES:

1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*, outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the *Standard Test Method for Classification of Soils for Engineering Purposes*, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

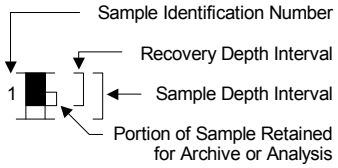
Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"trace gravel," "trace sand," "trace silt," etc., or not noted.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Rotosonic
5	Air Rotary (Rock)
6	Wash Rotary (Rock)
7	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
VST	Vane Shear Test
GT	Other Geotechnical Testing
CA	Chemical Analysis

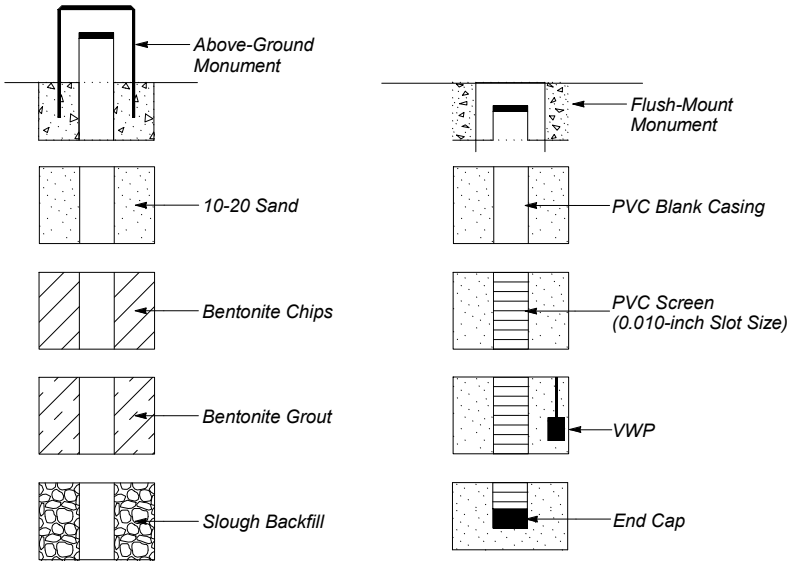
Groundwater

▽ Approximate water elevation at time of drilling (ATD).

▼ Approximate water elevation at other time(s). When multiple water levels are obtained other than ATD, only a representative range is shown. See text for additional information.

Note: Groundwater levels can fluctuate due to precipitation, seasonal conditions, and other factors.

Well Log Graphics



LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Soil Classification System and Key

Figure
A-1
(2 of 2)

LAI13

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

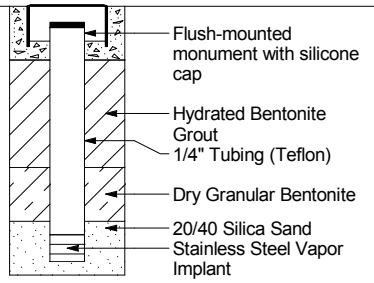
Drilling Method: Direct Push

Ground Elevation (ft): not measured

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Profile
0						AC	Asphalt concrete pavement
						SP	Grayish-brown, medium to course SAND with gravel; no odor, no sheen (medium dense, damp) **(FILL)**
		d3					**Soil sample: KSC-LAI13-S(1-3)**
5							**Soil Gas sample: KSC-LAI13-SG**
		d3				ML	Gray, SILT with sand; no odor, no sheen (medium stiff, moist) **(ALLUVIUM)**
							Soil sample: KSC-LAI13-S(8-10)
10						SM	Gray, silty, fine SAND; no odor, no sheen (medium dense, wet)
		d3					
15							**Groundwater sample: KSC-LAI13-GW**
20							
25							

Water Level: ATD

Soil Gas Monitoring Well Detail
(DOE#: BKF014)



Boring Completed 11/13/17
Total Depth of Boring = 15.0 ft.

Soil Gas Monitoring Well Completed 11/13/17
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not mesured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF014**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

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Kent, Washington

Log of Soil Gas Monitoring Well LAI13

Figure
A-2

LAI14

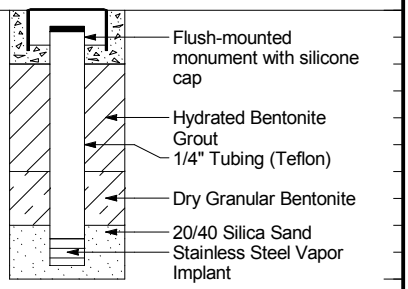
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	SOIL PROFILE
							Drilling Method: Direct Push Ground Elevation (ft): not measured
0				.7		SP	Gray, fine to coarse SAND with gravel (crushed concrete); no odor no sheen (very dense, damp) **(FILL)**
		d3					**Soil sample: KSC-LAI14-S(1-2.4)**
5							**Soil Gas sample: KSC-LAI14-SG**
		d3		.2			**Soil sample: KSC-LAI14-S(7.5-9.3)**
10							- becomes wet
		d3		.3			
15							**Groundwater sample: KSC-LAI14-GW**
				.1			
		d3					
20						SP-SM	Dark brown, fine SAND with silt; no odor, no sheen (medium dense, wet) **(ALLUVIUM)**
25							

GROUNDWATER

Water Level

ATD

Soil Gas Monitoring Well Detail
(DOE#: BKF016)



Boring Completed 07/10/18
Total Depth of Boring = 20.0 ft.

Soil Gas Monitoring Well Completed 11/13/17
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF016**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

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Kent, Washington

Log of Soil Gas Monitoring Well LAI14

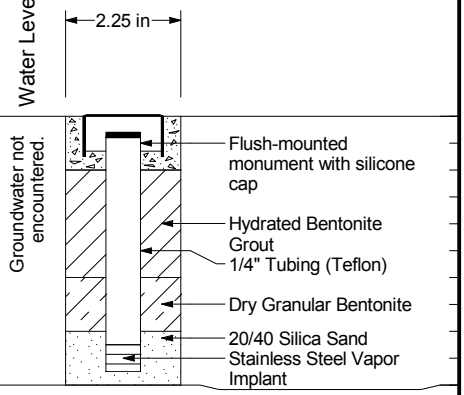
Figure
A-3

LAI15

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0		d3				SP	Brownish-gray, fine to course SAND with gravel (crushed concrete); no odor, no sheen (very dense, damp) **(FILL)**
5							**Soil gas sample: KSC-LAI15-SG**

Boring Completed 11/13/17
Total Depth of Boring = 5.0 ft.

Soil Gas Monitoring Well Detail
(DOE#: BKF015)



Soil Gas Monitoring Well Completed 11/13/17
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF015**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

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Kent, Washington

Log of Soil Gas Monitoring Well LAI15

Figure
A-4

LAI19

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

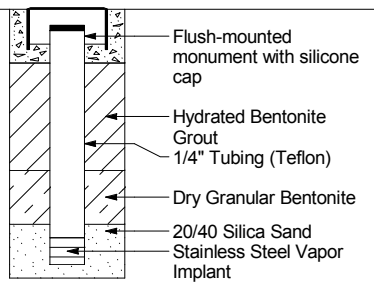
Drilling Method: Direct Push

Ground Elevation (ft): not measured

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Profile
0		d3		0		GP	Brown, sandy, fine to course GRAVEL; no odor, no sheen (dense, damp) **(FILL)**
							Soil sample: KSC-LAI19-S(1.5-3)
							Soil Gas sample: KSC-LAI19-SG
5		d3		0.2			
10		d3		0		ML SP	Brown, SILT with sand; no odor, no sheen (stiff, damp) **(ALLUVIUM)**
						ML	Brown-red, fine SAND; no odor, no sheen (dense, damp)
							Brown with iron oxide staining, clayey, SILT; no odor, no sheen (stiff, wet)
							Soil sample: KSC-LAI19-S(11-13)
15		d3		0			- grades to gray and without clay
						SM	Brown, silty, fine SAND; no odor, no sheen (dense, wet)
						ML	Gray SILT; no odor, no sheen (stiff, wet)
20							**Groundwater sample: KSC-LAI19-GW**
25							

Water Level: ATD

Soil Gas Monitoring Well Detail
(DOE#: BKF023)



Boring Completed 07/11/18
Total Depth of Boring = 20.0 ft.

Soil Gas Monitoring Well Completed 11/16/17
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF023**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI19

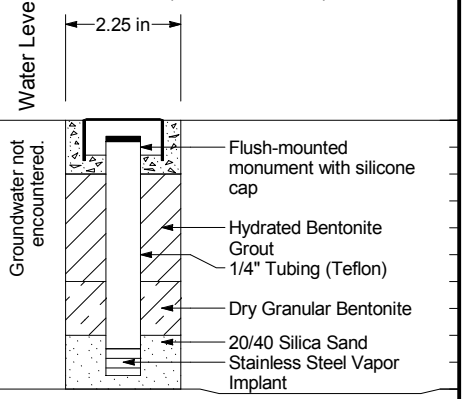
Figure
A-5

LAI20

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0		d3				SP	Brownish-gray, fine to course SAND with gravel (medium dense, damp) **(FILL)**
5							**Soil Gas sample: KSC-LAI20-SG**

Boring Completed 11/16/17
Total Depth of Boring = 5.0 ft.

Soil Gas Monitoring Well Detail
(DOE#: BKF024)



Soil Gas Monitoring Well Completed 11/16/17
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF024**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI20

Figure
A-6

LAI31

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

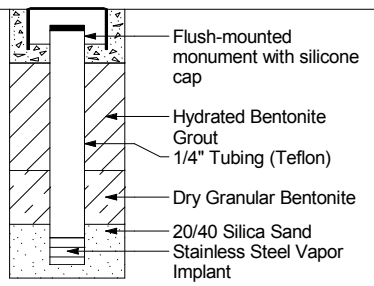
Drilling Method: Direct Push

Ground Elevation (ft): not measured

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Description
0						AC	Asphalt concrete pavement
						SP	Brown, gravelly, fine to course SAND; no odor, no sheen (medium dense, damp) **(FILL)**
		d3		0			
5				0			**Soil Gas sample: KSC-LAI31-SG**
		d3					
						ML	Gray, clayey SILT; no odor, no sheen (medium stiff, damp)
						SP-SM	**(ALLUVIUM)**
10							Brown, fine SAND with silt; no odor, no sheen (medium dense, damp)
						ML	**Soil sample: KSC-LAI31-S(10-11)**
		d3		0			- becomes wet
							Gray, clayey SILT; no odor, no sheen (medium stiff, wet)
15						SP-SM	Gray, fine SAND with silt; no odor, no sheen (medium dense, wet)
							Groundwater sample: KSC-LAI31-GW
		d3		0			
20							
25							

Water Level: ATD

Soil Gas Monitoring Well Detail (DOE#: BKF481)



Boring Completed 07/12/18
Total Depth of Boring = 20.0 ft.

Soil Gas Monitoring Well Completed 05/22/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF481**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI31

Figure
A-7

LAI32

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

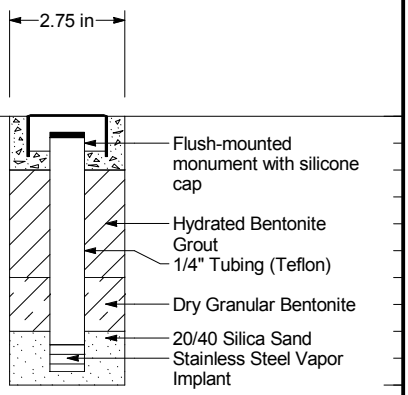
Drilling Method: Direct Push

Ground Elevation (ft): not measured

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Profile
0		d3		0		SP	Gray, fine to coarse SAND with gravel; no odor, no sheen (dense, damp) **(FILL)** **Soil sample: KSC-LAI32-S(2-3)** **Soil Gas sample: KSC-LAI32-SG**
5		d3		0		SP-SM	Gray, gravelly, fine to course SAND with silt; no odor, no sheen (dense, moist) **(ALLUVIUM)**
						ML	**Soil sample: KSC-LAI32-S(8-9)** Gray, clayey SILT; no odor, no sheen (stiff, moist)
10		d3		0		SP-SM	Gray, fine SAND with silt; no odor, no sheen (dense, wet) **Groundwater sample: KSC-LAI32-GW-20180712**
15		d3		0			
20							
25							

Water Level: ATD

Soil Gas Monitoring Well Detail
(DOE#: BKF477)



Boring Completed 07/12/18
Total Depth of Boring = 20.0 ft.

Soil Gas Monitoring Well Completed 05/21/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF477**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI32

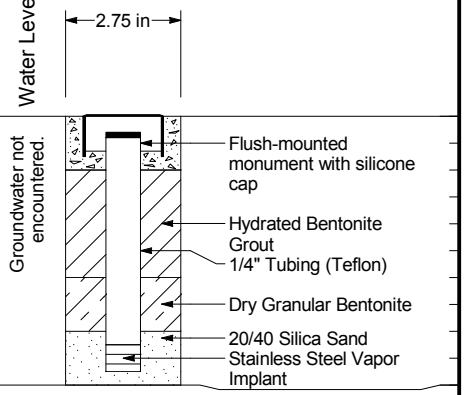
Figure
A-8

LAI33

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0						AC	Asphalt concrete pavement
		d3				SP	Brownish-gray, fine to course SAND with gravel; no odor, no sheen (medium dense, damp) **(FILL)**
5							**Soil Gas sample: KSC-LAI33-SG**

Boring Completed 05/21/18
Total Depth of Boring = 5.0 ft.

Soil Gas Monitoring Well Detail
(DOE#: BKF478)



Soil Gas Monitoring Well Completed 05/21/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

10
15
20
25

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF478**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI33

Figure
A-9

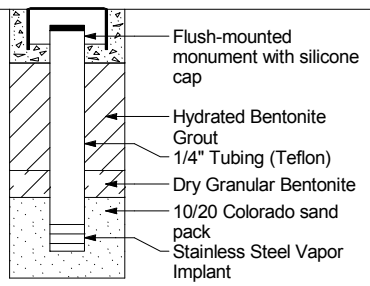
LAI35

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0						AC	Asphalt concrete pavement
				0		GP	Brown, sandy, fine to course GRAVEL; no odor, no sheen (medium dense, damp) **(FILL)**
		d3					**Soil Gas sample: KSC-LAI35-SG**
5				0		SP	Brown, fine to course SAND with gravel; no odor, no sheen (medium dense, damp) **(ALLUVIUM)**
		d3					**Soil sample: KSC-LAI35-S(7.5-8.5)**
						ML	Gray, clayey SILT; no odor, no sheen (medium stiff, wet)
10						SP	Brown, fine to course SAND with gravel; no odor, no sheen (medium dense, wet)
		d3				ML	Gray, clayey SILT; no odor, no sheen; iron oxide staining (medium stiff, wet)
				0		SP-SM	Gray, fine SAND with silt; no odor, no sheen (medium dense, wet)
15							**Groundwater sample: KSC-LAI35-GW**
20							
25							

Water Level

ATD

Soil Gas Monitoring Well Detail
(DOE#: BKF612)



Boring Completed 07/18/18
Total Depth of Boring = 15.0 ft.

Soil Gas Monitoring Well Completed 07/18/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKF612**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI35

Figure
A-10

LAI36

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Direct Push

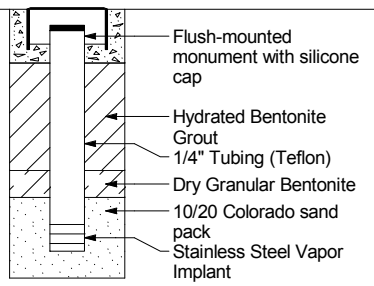
Ground Elevation (ft): not measured

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Description
0						AC	Asphalt concrete pavement
						SP	Brown, fine to course SAND with gravel; no odor, no sheen (medium dense, damp) **(FILL)**
		d3		0			
5				0.1			**Soil Gas sample: KSC-LAI36-SG**
		d3					
						ML	Gray, clayey, SILT; no odor, no sheen (medium stiff, damp to moist) **(ALLUVIUM)**
10							- 11.7 - 12.5 iron oxide staining
		d3		0		SP-SM	Gray, fine SAND with silt; no odor, no sheen (medium dense, wet)
15							**Groundwater sample: KSC-LAI35-GW**
		d3		0			
20							
25							

Water Level

ATD

Soil Gas Monitoring Well Detail
(DOE#: BKX637)



Boring Completed 07/12/18
Total Depth of Boring = 20.0 ft.

Soil Gas Monitoring Well Completed 07/12/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKX637**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

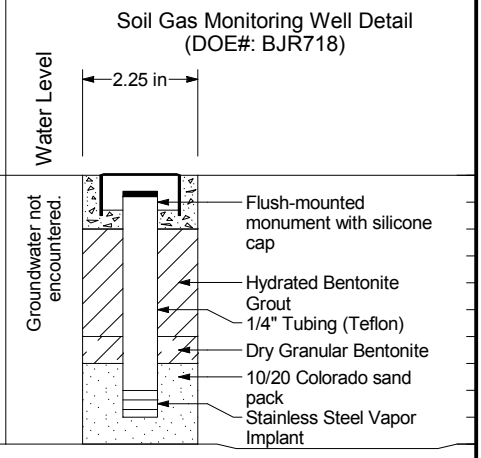
Log of Soil Gas Monitoring Well LAI36

Figure
A-11

LAI37

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0		d3		0		GP	Brown, sandy, fine to course GRAVEL; no odor, no sheen (dense, damp) **(FILL)** **Soil sample: KSC-LAI37-S(2.7-3.7)** **Soil Gas sample: KSC-LAI37-SG**
5							
10							
15							
20							
25							

Boring Completed 07/11/18
Total Depth of Boring = 5.0 ft.



Soil Gas Monitoring Well Completed 07/11/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BJR718**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI37

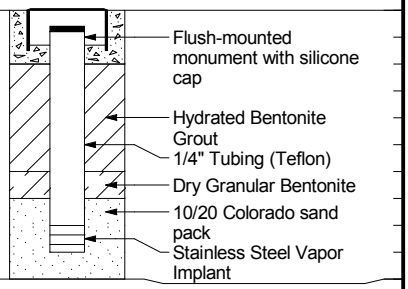
Figure
A-12

LAI38

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0		d3		0.1		GP	Brown, sandy, fine to course GRAVEL; no odor, no sheen (dense, damp) **(FILL)** **Soil sample: KSC-LAI19-S(3-3.6)** **Soil Gas sample: KSC-LAI38-SG**
5							
10							
15							
20							
25							

Water Level: Groundwater not encountered.

Soil Gas Monitoring Well Detail
(DOE#: BKX598)



Boring Completed 07/11/18
Total Depth of Boring = 5.0 ft.

Soil Gas Monitoring Well Completed 07/11/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BKX598**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

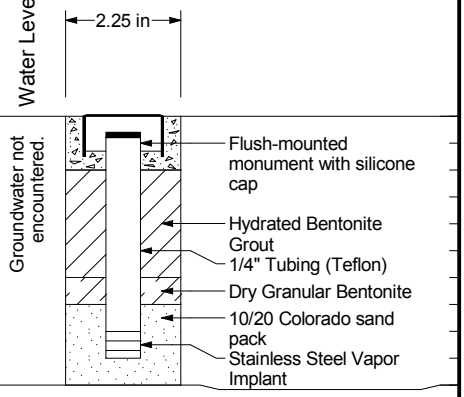
Log of Soil Gas Monitoring Well LAI38

Figure
A-13

LAI39

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0		d3		0		GP	Brown, sandy, fine to course GRAVEL; no odor, no sheen (dense, damp) **(FILL)** **Soil sample: KSC-LAI-S(2-3)** **Soil Gas sample: KSC-LAI39-SG**
5							
10							
15							
20							
25							

Soil Gas Monitoring Well Detail
(DOE#: BJR999)



Boring Completed 07/11/18
Total Depth of Boring = 5.0 ft.

Soil Gas Monitoring Well Completed 07/11/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BJR999**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

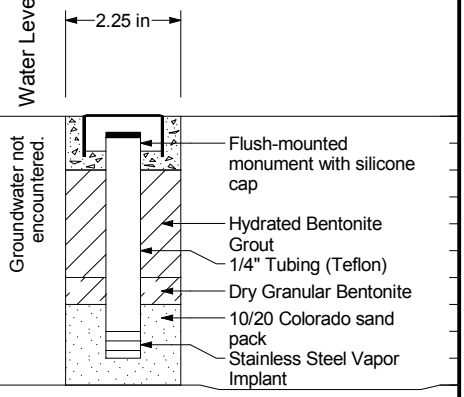
Log of Soil Gas Monitoring Well LAI39

Figure
A-14

LAI40

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured
0		d3		0		GP	Brown, sandy, fine to course GRAVEL; no odor, no sheen (dense, damp) **(FILL)** **Soil sample: KSC-LAI40-S(3-4)** **Soil Gas sample: KSC-LAI40-SG**
5							
10							
15							
20							
25							

Soil Gas Monitoring Well Detail
(DOE#: BRX597)



Boring Completed 07/11/18
Total Depth of Boring = 5.0 ft.

Soil Gas Monitoring Well Completed 07/11/18
Elevation at Top of Protective Casing = not measured
Elevation at Top of Soil Gas Monitoring Well Casing = not measured
Total Depth of Soil Gas Monitoring Well = 4.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.
4. **ECY Unique Well Number BRX597**

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ WELL LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Soil Gas Monitoring Well LAI40

Figure
A-15

LAI44

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Direct Push Ground Elevation (ft): not measured	Water Level
0				0		GP	Brown to gray, sandy, fine to coarse GRAVEL; no odor, no sheen (dense, damp) **(FILL)**	
		d3						
5				0				
		d3					**Soil sample: KSC-LAI-S(7-8)** - 7.4 to 7.6 asphalt - becomes wet	ATD
10						SP	Brown, gravelly, fine to coarse SAND; no odor, no sheen (medium dense, wet) **(FILL)**	
		d3		0			**Groundwater sample: KSC-LAI44-GW**	
						ML SP	Gray, clayey SILT; no odor, no sheen (stiff, moist to wet) **(ALLUVIUM)**	
15							Gray, fine SAND; no odor, no sheen (medium dense, wet)	
20								
25								

Boring Completed 07/18/18
Total Depth of Boring = 15.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25213.21 8/28/18 N:\PROJECTS\25213.210.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Boeing Kent Space Center
Kent, Washington

Log of Boring LAI44

Figure
A-16

Laboratory Report and Data Validation (Supplemental RI PCB Investigation)

DATA VALIDATION REPORT

BOEING KENT SPACE CENTER
GROUNDWATER & SOIL SAMPLING

Prepared for:

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EcoChem Project: C8105-2

June 1, 2018

Approved for Release:

Christina Mott Frans
Senior Project Manager
EcoChem, Inc.

PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of the summary validation (Stage 2A) performed on groundwater and soil samples and the associated laboratory and field quality control samples for the Boeing Kent Space Center. A complete list of samples is provided in the Sample Index.

Samples were analyzed by Analytical Resources, Incorporated, Tukwila, Washington. The analytical method and EcoChem project chemists are listed in the following table:

ANALYSIS	METHOD OF ANALYSIS	PRIMARY REVIEW	SECONDARY REVIEW
PCB Aroclors	SW8082A	C. Frans	R. Frans

The data were reviewed using guidance and quality control criteria documented in the analytical methods; the sampling and analysis plan (SAP) for the *Remedial Investigation Work Plan Boeing Kent Space Center Facility, Ecology Review Draft* (Landau Associates, July 29, 2016) and *USEPA National Functional Guidelines for Organic Data Review* (EPA, 1999 & 2008).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Validation criteria are included at the end of the report. No data were qualified for any reason. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
Boeing Kent Space Center

SDG	Sample ID	Lab Sample ID	PCB
18E0127	KSCRI-SB21-(1-3)-050718	18E0127-01	✓
	KSCRI-SB22-(1-3)-050718	18E0127-02	✓
	KSCRI-SB23-(1-3)-050718	18E0127-03	✓
	KSCRI-SB24-(1-3)-050718	18E0127-04	✓
	KSCRI-SB25-(1-3)-050718	18E0127-05	✓
	KSC-SB21-GW-050718	18E0127-06	✓
	KSC-SB22-GW-050718	18E0127-07	✓
	KSC-SB23-GW-050718	18E0127-08	✓
	KSC-SB24-GW-050718	18E0127-09	✓
	KSC-SB25-GW-050718	18E0127-10	✓
	KSC-DUP-GW-050718	18E0127-11	✓

DATA VALIDATION REPORT
DOF – Boeing Kent Space Center
Polychlorinated Biphenyl Compounds - Method SW8082A

This report documents the review of analytical data from the analyses of soil and groundwater samples and the associated field and laboratory quality control (QC) samples. Samples were analyzed by Analytical Resources, Incorporated, Tukwila, Washington. Refer to the Sample Index for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
18E0127	5 soil samples	Stage 2A
	6 groundwater samples	

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

All sample IDs and results reported in the electronic data deliverable (EDD) were verified (10% verification) by comparing the EDD to the laboratory data package.

TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Preservation and Holding Times	✓	Matrix Spikes/Matrix Spike Duplicates
✓	Laboratory Blanks	1	Field Duplicates
1	Field Blanks	✓	Target Analyte List
✓	Surrogate Compounds	✓	Reporting Limits
✓	Laboratory Control Samples (LCS)	✓	Reported Results

✓ *Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed*
1 *Quality control outliers are discussed below, but no data were qualified.*
2 *Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.*

Sample Receipt, Preservation, and Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of 0°C-6°C and be extracted within 14 days for sediment samples and extracts must be analyzed within 40 days of extraction.

Several samples were received at a temperature greater than the advisory temperature range at 10.1°C. PCB Aroclor compounds are stable at this temperature; no qualifiers were required.

All samples were extracted and analyzed within the required holding times.

Field Blanks

No field blanks were submitted with this sampling event.

Field Duplicates

For water samples, the QAPP RPD control limit is 20% for results greater than 5x the reporting limit (RL). For results less than 5x the RL, the absolute difference between the sample and replicate must be less than 2x the RL.

One field duplicate pair was included with this SDG, Samples KSC-SB23-GW-050718 & KCS-DUP-GW-050718. No target analytes were detected in either sample; field precision was acceptable.

Target Analyte List

All target analytes as specified in the QAPP/SAP were reported.

Reporting Limits

The target analyte reporting limits specified in the QAPP/SAP were met.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable, as demonstrated by the surrogate and laboratory control sample (LCS) percent recovery values. Precision was also acceptable as demonstrated by the MS/MSD and field duplicate RPD values.

No data were qualified for any reason.

All data, as reported, are acceptable for use.

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample					
Cooler/Storage Temperature Preservation	4°C ± 2°C Tissue/sediments (may be frozen -20°C)	NFG [1] Method [2]	**If required by project:** J (pos)/UJ (ND) if greater than 6° C	1	Use Professional Judgment (PJ) to qualify for temperature outlier. Current SW846 criterion is ≤ 6° C [3]
Holding Time	**Extraction Aqueous:** 7 days from collection **Extraction Solid:** 14 days from collection **Exraction Tissue/Sediment (frozen):** 1 year **Analysis (all matrices)**: 40 days from extraction	NFG [1] Method [2]	**If required by project:** J (pos)/UJ (ND) if ext/analyzed > HT J (pos)/R (ND) if gross exceedance (> 2x HT)	1	Use PJ to qualify for holding time outlier. ***Current SW846 does not have an extraction holding time limit.*** [3] Gross exceedance > 2x HT, as per NFG 1999
Instrument Performance					
Retention Times	Surrogates: TCMX (± 0.05); DCB (± 0.10) Aroclors (± 0.07)	NFG [1]	NJ (pos)/R (ND) results for analytes with RT shifts	24	
Initial Calibration	Minimum 5 point with RSD ≤ 20% OR correlation coefficient (r-value) ≥ 0.995 OR Minimum 6-point with co-efficient of determination (r2-value) ≥ 0.99	NFG [1] Method [4]	J (pos) if %RSD greater than 20% OR r-value < 0.995 OR r^2-value < 0.99	5A	Refer to TM-01 for additional information. Use bias flags (H,L)[5] where appropriate
Initial Calibration Verification (ICV)	No NFG criteria. Project specific.	Project	J (pos) if > UCL J (pos)/UJ (ND) if < LCL	5B	Use bias flags (H,L) where appropriate
Continuing Calibration (Prior to each 12 hr. shift)	%D ± 20%	Method [2]	If > 20% (high bias): J (pos) If <20% (low bias: J (pos)/UJ (ND)	5B	Refer to TM-01 for additional information. Use bias flags (H,L) where appropriate
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG [1] Method [2]	U (pos) if result is less than appropriate 5X action level.	7	**Hierarchy of blank review:** **#1 - Review MB and IB, qualify as needed** **#2 - Review FB , qualify as needed** Note: Actions as per NFG 1999 Note: IB not required by method
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL	NFG [1] Method [2]	U (pos) if result is less than appropriate 5X action level.	6	
Instrument Blanks (IB)	Analyzed at the beginning and end of every 12 hour sequence No analyte > CRQL	NFG [1]	U (pos) if result is less than appropriate 5X action level.	7	

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	One set per matrix per batch (of ≤ 20 samples) AR1016 and AR1260: %R = 29% - 135%, or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J (pos) if both %R > upper control limit (UCL) J (pos)/UJ (ND) if both %R < lower control limit (LCL) J (pos)/R (ND) if both %R < 10%	8	No action if only one spike %R is outside criteria. No action if native analyte conc. > 5x the amount spiked. Use bias flags (H,L) where appropriate. Actions apply to all Aroclors in parent sample.
MS/MSD (RPD)	One set per matrix per batch (of ≤ 20 samples) AR1016: RPD < 15%, AR1260: RPD < 20% or project limits	NFG (1) Method (2)	Qualify parent only unless other QC indicates systematic problems. J (pos) if RPD > control limit	9	No action if parent is ND.
LCS	One per lab batch (of ≤ 20 samples) AR1016 and AR1260: %R = 50% - 150%, or project limits	NFG (1)	J (pos) if %R > UCL J (pos)/UJ (ND) if %R < LCL J (pos)/R (ND) if %R < 10%	10	Use bias flags (H,L) where appropriate. Actions apply to all Aroclors in associated samples.
LCS/LCSD (RPD)	if analyzed use MS/MSD RPD criteria	NFG (1)	J (pos) assoc. compound in all samples	9	LCSD not required by method or NFG
Precision and Accuracy					
Surrogates	TCMX and DCBP added to every sample %R = 30% - 150% or project limits	NFG (1) Method (2)	J (pos) if either %R > UCL J (pos)/UJ (ND) if either %R < LCL J (pos)/R (ND) if either %R < 10%	13	If %R < 10% (sample dilution is a factor), use PJ Use bias flags (H,L) where appropriate
Internal Standards (if used)	Acceptable Range: IS area = 50% to 200% of CCAL area RT within 30 seconds of CC RT	Method (2)	J (pos) if area > 200% J (pos)/UJ (ND) if area < 50% J (pos)/R (ND) if area < 25% RT > 30 seconds, narrate	19	
Field Duplicates	**Solids:** RPD < 50% OR difference < 2X RL (for results < 5X RL) **Aqueous:** RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem	J (pos)/UJ (ND) Qualify only parent and field duplicate samples	9	use project limits if specified

PCB Aroclors by GC
(Based on Organic NFG 2008 and SW-846 Method 8082A)

QC Element	Acceptance Criteria (NFG)	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound Identification/Quantification					
Quantitation/ Identification	Between two columns: RPD < 40% or %D < 25% Within Retention Time Windows on both columns.	NFG [1] Method [2]	J (pos) if RPD = 40% - 60% (25% - 60% for %D) NJ (pos) if > 60% R (pos) if RTW criterion not met	3	See TM-08 for additional info.
Calibration Range	on column concentration < high calibration standard	NFG [1] Method [2]	J (pos) if conc > high standard and sample was not diluted	20	
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	TM-04 Rev. 1 for additional info.
Sample Clean-up					
GPC/Sulfur/ Florisil/Acid	No criteria - cleanups are optional	NFG [1] Method [2]	Use Professional Judgment	14	special cleanups may be required for project cleanup standards may be associated with GPC/florisil cleanups

[1] National Functional Guidelines for Organic Data Review, June, 2008
[2] Polychlorinated Biphenyls (PCBs) by Gas Chromatography USEPA Method SW846 8082A, Feb 2007, Rev. 1
[3] SW846, Chapter 4, Organic Analytes
[4] Determinative Chromatographic Separations , Method 8000C , March 2003, Rev.3
[5] "H" = high bias indicated; "L" = low bias indicated

Analytical Resources, Incorporated
Analytical Chemists and Consultants

22 May 2018

Natasya Gray
Dalton, Olmsted & Fuglevand, Inc
1420 - 156th Ave., NE STE C1
Bellevue, WA 98007

RE: Boeing Kent Space Center

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18E0127	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18E0127	Turn-around Requested: NORMAL
ARI Client Company: DOF	Phone: 206-731-7550
Client Contact: TASYA GRAY NGRAY@DOFNW.COM	
Client Project Name: BOEING KSC RI	
Client Project #: B-002	Samplers: D COOPER / L KENNEY

Page: 1 of 2

Date: 5/7/18 Ice Present? Yes

No. of Coolers: 2 Cooler Temps: 5.4°C 10.1°C

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Analytical Chemists and Consultants
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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: PCBs EPA 8082	Notes/Comments
KSCRI-SB21-(1-3)-050718	5/7/18	0900	SOIL	1	X	
KSCRI-SB22-(1-3)-050718		1030		1	X	
KSCRI-SB23-(1-3)-050718		1100		1	X	
KSCRI-SB24-(1-3)-050718		1145		1	X	
KSCRI-SB25-(1-3)-050718		1400		2	X	MS/MSD

Comments/Special Instructions

RL of 20 µg/kg

	Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)				
Printed Name:	Luke Kenney	Jacob Slater		
Company:	DOF	ARI		
Date & Time:	5-8-18 0875	05/08/18 0825		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18E0127	Turn-around Requested: NORMAL	Page: 2 of 2	
ARI Client Company: DOF	Phone: 206-731-7550	Date: 5/7/18	Ice Present? Yes
Client Contact: TASYA GRAY	NGRAY@DOFNW.COM	No. of Coolers: 2	Cooler Temps: 5.4°C 10.1°C
Client Project Name: BOEING KSC RI			
Client Project #: B-002	Samplers: D COOPER / L KENNY		

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Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: PCBs 60A 8082	Notes/Comments
KSC-SB21-GW-050718	5/7/18	1000	WATER	6	X	MS/MSD
KSC-SB22-GW-050718		1130		1	X	
KSC-SB23-GW-050718		1230		2	X	
KSC-SB24-GW-050718		1330		2	X	
KSC-SB25-GW-050718		~~1330~~ 1500 1550		2	X	
KSC-DUP-GW-050718		~~1500~~ 1235		2	X	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
RL 0.01 µg/L	Printed Name: Luke Ihrer	Printed Name: Jacob Walter	Printed Name:	Printed Name:
	Company: DOF	Company: ARI	Company:	Company:
	Date & Time: 5-8-18 0825	Date & Time: 05/08/18 0825	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
KSCRI-SB21-(1-3)-050718	18E0127-01	Solid	07-May-2018 09:00	08-May-2018 08:25
KSCRI-SB22-(1-3)-050718	18E0127-02	Solid	07-May-2018 10:30	08-May-2018 08:25
KSCRI-SB23-(1-3)-050718	18E0127-03	Solid	07-May-2018 11:00	08-May-2018 08:25
KSCRI-SB24-(1-3)-050718	18E0127-04	Solid	07-May-2018 11:45	08-May-2018 08:25
KSCRI-SB25-(1-3)-050718	18E0127-05	Solid	07-May-2018 14:00	08-May-2018 08:25
KSC-SB21-GW-050718	18E0127-06	Water	07-May-2018 10:00	08-May-2018 08:25
KSC-SB22-GW-050718	18E0127-07	Water	07-May-2018 11:30	08-May-2018 08:25
KSC-SB23-GW-050718	18E0127-08	Water	07-May-2018 12:30	08-May-2018 08:25
KSC-SB24-GW-050718	18E0127-09	Water	07-May-2018 13:30	08-May-2018 08:25
KSC-SB25-GW-050718	18E0127-10	Water	07-May-2018 15:00	08-May-2018 08:25
KSC-DUP-GW-050718	18E0127-11	Water	07-May-2018 12:35	08-May-2018 08:25

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Case Narrative

Sample receipt

Samples as listed on the preceding page were received May 8, 2018 under ARI work order 18E0127. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Printed: 5/8/2018 11:17:33AM

WORK ORDER

18E0127

Client: Dalton, Olmsted & Fuglevand, Inc
Project: Boeing Kent Space Center

Project Manager: Kelly Bottem
Project Number: [none]

Report To:
Dalton, Olmsted & Fuglevand, Inc
Dave Cooper
1420 - 156th Ave., NE STE C1
Bellevue, WA 98007
Phone: (206) 660-3466
Fax: -

Invoice To:
Dalton, Olmsted & Fuglevand, Inc
Dave Cooper
1420 - 156th Ave., NE STE C1
Bellevue, WA 98007
Phone :(206) 660-3466
Fax: -

Date Due:	22-May-2018 18:00 (10 day TAT)		
Received By:	Jacob Walter	Date Received:	08-May-2018 08:25
Logged In By:	Jacob Walter	Date Logged In:	08-May-2018 10:59

Samples Received at: **5.4°C**

Intact, properly signed and dated custody seals attached to outside of cooler(s)	No	Custody papers included with the cooler	Yes
Custody papers properly filled out (in, signed, analyses requested, etc)	Yes	Was a temperature blank included in the cooler	No
Was sufficient ice used (if appropriate)	Yes	All bottles sealed in individual plastic bags	No
All bottles arrived in good condition (unbroken)	Yes	All bottle labels complete and legible	Yes
Number of containers listed on COC match number received	Yes	Bottle labels and tags agree with COC	Yes
Correct bottles used for the requested analyses	Yes	All VOC vials free of air bubbles	No
Analyses/bottles require preservation (attach preservation sheet excluding VOC)	No	Sufficient amount of sample sent in each bottle	Yes
Sample split at ARI	No		

Analysis	Due	TAT	Expires	Comments

WORK ORDER

18E0127

Client: Dalton, Olmsted & Fuglevand, Inc **Project Manager:** Kelly Bottem

Project: Boeing Kent Space Center **Project Number:** [none]

Analysis	Due	TAT	Expires	Comments
18E0127-01 KSCRI-SB21-(1-3)-050718 [Solid] Sampled 07-May-2018 09:00 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass WM, Clear, 8 oz				
Solids, Total, Dried at 103 -105 °C, Soli	22-May-2018 15:00	10	04-Jun-2018 09:00	
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	21-May-2018 09:00	
18E0127-02 KSCRI-SB22-(1-3)-050718 [Solid] Sampled 07-May-2018 10:30 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass WM, Clear, 8 oz				
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	21-May-2018 10:30	
Solids, Total, Dried at 103 -105 °C, Soli	22-May-2018 15:00	10	04-Jun-2018 10:30	
18E0127-03 KSCRI-SB23-(1-3)-050718 [Solid] Sampled 07-May-2018 11:00 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass WM, Clear, 8 oz				
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	21-May-2018 11:00	
Solids, Total, Dried at 103 -105 °C, Soli	22-May-2018 15:00	10	04-Jun-2018 11:00	
18E0127-04 KSCRI-SB24-(1-3)-050718 [Solid] Sampled 07-May-2018 11:45 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass WM, Clear, 8 oz				
Solids, Total, Dried at 103 -105 °C, Soli	22-May-2018 15:00	10	04-Jun-2018 11:45	
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	21-May-2018 11:45	
18E0127-05 KSCRI-SB25-(1-3)-050718 [Solid] Sampled 07-May-2018 14:00 (GMT-08:00) Pacific Time (US & Canada)				**MS/MSD**
A = Glass WM, Clear, 8 oz *B = Glass WM, Clear, 8 oz*				
Solids, Total, Dried at 103 -105 °C, Soli	22-May-2018 15:00	10	04-Jun-2018 14:00	
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	21-May-2018 14:00	
18E0127-06 KSC-SB21-GW-050718 [Water] Sampled 07-May-2018 10:00 (GMT-08:00) Pacific Time (US & Canada)				**MS/MSD**
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL* *C = Glass NM, Amber, 1000 mL* *D = Glass NM, Amber, 1000 mL* *E = Glass NM, Amber, 1000 mL* *F = Glass NM, Amber, 1000 mL*				
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	14-May-2018 10:00	
18E0127-07 KSC-SB22-GW-050718 [Water] Sampled 07-May-2018 11:30 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL				
8082A PCB (20 ug/kg) or (MTCA 0.1 u;	22-May-2018 15:00	10	14-May-2018 11:30	

WORK ORDER

18E0127

Client: Dalton, Olmsted & Fuglevand, Inc
Project Manager: Kelly Bottem
Project: Boeing Kent Space Center
Project Number: [none]

Analysis	Due	TAT	Expires	Comments
18E0127-08 KSC-SB23-GW-050718 [Water] Sampled 07-May-2018 12:30 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8082A PCB (20 ug/kg) or (MTCA 0.1 u	22-May-2018 15:00	10	14-May-2018 12:30	
18E0127-09 KSC-SB24-GW-050718 [Water] Sampled 07-May-2018 13:30 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8082A PCB (20 ug/kg) or (MTCA 0.1 u	22-May-2018 15:00	10	14-May-2018 13:30	
18E0127-10 KSC-SB25-GW-050718 [Water] Sampled 07-May-2018 15:00 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8082A PCB (20 ug/kg) or (MTCA 0.1 u	22-May-2018 15:00	10	14-May-2018 15:00	
18E0127-11 KSC-DUP-GW-050718 [Water] Sampled 07-May-2018 12:35 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8082A PCB (20 ug/kg) or (MTCA 0.1 u	22-May-2018 15:00	10	14-May-2018 12:35	

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: DOF

COC No(s): _____ NA

Assigned ARI Job No: 18E0127

Project Name: _____

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.4°C 10.1°C

Time: 0825

If cooler temperature is out of compliance fill out form 00070F Cooler #1 #2 Temp Gun ID#: D00S206

Cooler Accepted by: JSW Date: 05/08/18 Time: 0825

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

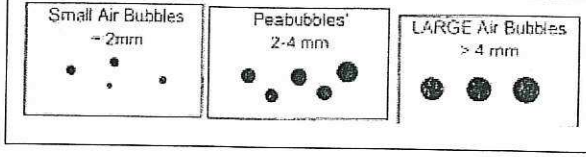
Samples Logged by: JSW Date: 05/08/18 Time: 1058

*** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Temperature Compliance Form

ARI Work Order: 18E0127

Cooler#: 1 **Temperature(°C):** 5.4°C

Sample ID	Bottle Count	Bottle Type
In temp		

Cooler#: 2 **Temperature(°C):** 10.1°C

Sample ID	Bottle Count	Bottle Type
Samples Received above 6°C		
ICSC-SB22-GW-050718	1	1LAB
ICSC-SB23-GW-050718	2	1LAB
ICSC-SB24-GW-050718	2	1LAB
ICSC-SB25-GW-050718	2	1LAB
ICSC-Dup-GW-050718	2	1LAB

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Cooler#: _____ **Temperature(°C):** _____

Sample ID	Bottle Count	Bottle Type

Completed by: JRW Date: 05/08/18 Time: 0825

Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB21-(1-3)-050718

18E0127-01 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 09:00

Instrument: ECD7 — Analyzed: 18-May-2018 14:02

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		
	Preparation Batch: BGE0349	Sample Size: 6.06 g (wet)	Dry Weight:5.53 g
	Prepared: 14-May-2018	Final Volume: 5 mL	% Solids: 91.19
Sample Cleanup:	Cleanup Method: Sulfuric Acid		
	Cleanup Batch: CGE0102	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		
	Cleanup Batch: CGE0103	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	7.2	18.1	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	7.2	18.1	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	7.2	18.1	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	7.2	18.1	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	7.2	18.1	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	7.2	18.1	**20.3**	ug/kg	
Aroclor 1260	11096-82-5	1	8.4	18.1	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	8.4	18.1	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	8.4	18.1	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-133 %*	*94.7*	*%*	
Surrogate: Tetrachlorometaxylene				*53-120 %*	*104*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-133 %*	*92.3*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*53-120 %*	*97.3*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB21-(1-3)-050718

18E0127-01 (Solid)

Extractions

Method: PSEP 1986 — Sampled: 05/07/2018 09:00

Instrument: N/A — Analyzed: 08-May-2018 12:34

Sample Preparation: Preparation Method: No Prep-Organics
Preparation Batch: BGE0220 — Sample Size: 1 g (wet)
Prepared: 08-May-2018 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	**91.19**	%	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB22-(1-3)-050718

18E0127-02 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 10:30

Instrument: ECD7 — Analyzed: 18-May-2018 14:24

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		
	Preparation Batch: BGE0349	Sample Size: 6 g (wet)	Dry Weight:5.59 g
	Prepared: 14-May-2018	Final Volume: 5 mL	% Solids: 93.21
Sample Cleanup:	Cleanup Method: Sulfuric Acid		
	Cleanup Batch: CGE0102	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		
	Cleanup Batch: CGE0103	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	7.2	17.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	7.2	17.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	7.2	17.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	7.2	17.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	7.2	17.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	7.2	17.9	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	8.3	17.9	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	8.3	17.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	8.3	17.9	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-133 %*	*100*	*%*	
Surrogate: Tetrachlorometaxylene				*53-120 %*	*104*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-133 %*	*96.6*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*53-120 %*	*98.6*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB22-(1-3)-050718

18E0127-02 (Solid)

Extractions

Method: PSEP 1986 — Sampled: 05/07/2018 10:30

Instrument: N/A — Analyzed: 08-May-2018 12:34

Sample Preparation: Preparation Method: No Prep-Organics
Preparation Batch: BGE0220 — Sample Size: 1 g (wet)
Prepared: 08-May-2018 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	**93.21**	%	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB23-(1-3)-050718

18E0127-03 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 11:00

Instrument: ECD7 — Analyzed: 18-May-2018 14:46

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		
	Preparation Batch: BGE0349	Sample Size: 6.13 g (wet)	Dry Weight:5.60 g
	Prepared: 14-May-2018	Final Volume: 5 mL	% Solids: 91.30
Sample Cleanup:	Cleanup Method: Sulfuric Acid		
	Cleanup Batch: CGE0102	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		
	Cleanup Batch: CGE0103	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	7.1	17.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	7.1	17.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	7.1	17.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	7.1	17.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	7.1	17.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	7.1	17.9	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	8.3	17.9	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	8.3	17.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	8.3	17.9	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-133 %*	*99.7*	*%*	
Surrogate: Tetrachlorometaxylene				*53-120 %*	*104*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-133 %*	*96.1*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*53-120 %*	*97.5*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB23-(1-3)-050718

18E0127-03 (Solid)

Extractions

Method: PSEP 1986 — Sampled: 05/07/2018 11:00

Instrument: N/A — Analyzed: 08-May-2018 12:34

Sample Preparation: Preparation Method: No Prep-Organics
Preparation Batch: BGE0220 — Sample Size: 1 g (wet)
Prepared: 08-May-2018 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	**91.30**	%	

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1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB24-(1-3)-050718

18E0127-04 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 11:45

Instrument: ECD7 — Analyzed: 18-May-2018 15:09

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		
	Preparation Batch: BGE0349	Sample Size: 6.11 g (wet)	Dry Weight:5.46 g
	Prepared: 14-May-2018	Final Volume: 5 mL	% Solids: 89.36
Sample Cleanup:	Cleanup Method: Sulfuric Acid		
	Cleanup Batch: CGE0102	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		
	Cleanup Batch: CGE0103	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	7.3	18.3	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	7.3	18.3	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	7.3	18.3	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	7.3	18.3	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	7.3	18.3	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	7.3	18.3	**8.4**	ug/kg	J
Aroclor 1260	11096-82-5	1	8.5	18.3	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	8.5	18.3	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	8.5	18.3	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-133 %*	*95.6*	*%*	
Surrogate: Tetrachlorometaxylene				*53-120 %*	*96.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-133 %*	*91.5*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*53-120 %*	*96.9*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB24-(1-3)-050718

18E0127-04 (Solid)

Extractions

Method: PSEP 1986 — Sampled: 05/07/2018 11:45

Instrument: N/A — Analyzed: 08-May-2018 12:34

Sample Preparation: Preparation Method: No Prep-Organics
Preparation Batch: BGE0220 — Sample Size: 1 g (wet)
Prepared: 08-May-2018 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	**89.36**	%	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB25-(1-3)-050718

18E0127-05 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 14:00

Instrument: ECD7 — Analyzed: 18-May-2018 15:31

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		
	Preparation Batch: BGE0349	Sample Size: 6.01 g (wet)	Dry Weight:5.27 g
	Prepared: 14-May-2018	Final Volume: 5 mL	% Solids: 87.66
Sample Cleanup:	Cleanup Method: Sulfuric Acid		
	Cleanup Batch: CGE0102	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		
	Cleanup Batch: CGE0103	Initial Volume: 5 mL	
	Cleaned: 18-May-2018	Final Volume: 5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	7.6	19.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	7.6	19.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	7.6	19.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	7.6	19.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	7.6	19.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	7.6	19.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	8.8	19.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	8.8	19.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	8.8	19.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-133 %*	*93.6*	*%*	
Surrogate: Tetrachlorometaxylene				*53-120 %*	*97.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-133 %*	*90.8*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*53-120 %*	*95.2*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSCRI-SB25-(1-3)-050718

18E0127-05 (Solid)

Extractions

Method: PSEP 1986 — Sampled: 05/07/2018 14:00

Instrument: N/A — Analyzed: 08-May-2018 12:34

Sample Preparation: Preparation Method: No Prep-Organics
Preparation Batch: BGE0220 — Sample Size: 1 g (wet)
Prepared: 08-May-2018 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	**87.66**	%	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSC-SB21-GW-050718

18E0127-06 (Water)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 10:00

Instrument: ECD7 — Analyzed: 18-May-2018 21:05

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGE0280	Sample Size: 1000 mL
	Prepared: 10-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGE0106	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid	
	Cleanup Batch: CGE0104	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGE0105	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				*29-120 %*	*59.3*	*%*	
Surrogate: Tetrachlorometaxylene				*32-120 %*	*55.4*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*29-120 %*	*57.9*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*32-120 %*	*53.4*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSC-SB22-GW-050718

18E0127-07 (Water)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 11:30

Instrument: ECD7 — Analyzed: 18-May-2018 22:12

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGE0280	Sample Size: 1000 mL
	Prepared: 10-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGE0106	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid	
	Cleanup Batch: CGE0104	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGE0105	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	**0.008**	ug/L	J
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				*29-120 %*	*32.7*	*%*	
Surrogate: Tetrachlorometaxylene				*32-120 %*	*48.1*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*29-120 %*	*32.4*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*32-120 %*	*44.1*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSC-SB23-GW-050718

18E0127-08 (Water)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 12:30

Instrument: ECD7 — Analyzed: 18-May-2018 22:34

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGE0280	Sample Size: 1000 mL
	Prepared: 10-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGE0106	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid	
	Cleanup Batch: CGE0104	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGE0105	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				*29-120 %*	*66.7*	*%*	
Surrogate: Tetrachlorometaxylene				*32-120 %*	*55.6*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*29-120 %*	*64.7*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*32-120 %*	*53.7*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSC-SB24-GW-050718

18E0127-09 (Water)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 13:30

Instrument: ECD7 — Analyzed: 18-May-2018 22:56

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGE0280	Sample Size: 1000 mL
	Prepared: 10-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGE0106	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid	
	Cleanup Batch: CGE0104	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGE0105	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				*29-120 %*	*66.4*	*%*	
Surrogate: Tetrachlorometaxylene				*32-120 %*	*54.7*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*29-120 %*	*63.7*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*32-120 %*	*54.5*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSC-SB25-GW-050718

18E0127-10 (Water)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 15:00

Instrument: ECD7 — Analyzed: 18-May-2018 23:19

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGE0280	Sample Size: 1000 mL
	Prepared: 10-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGE0106	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid	
	Cleanup Batch: CGE0104	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGE0105	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				*29-120 %*	*61.8*	*%*	
Surrogate: Tetrachlorometaxylene				*32-120 %*	*56.2*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*29-120 %*	*59.9*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*32-120 %*	*55.1*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

KSC-DUP-GW-050718

18E0127-11 (Water)

Aroclor PCB

Method: EPA 8082A — Sampled: 05/07/2018 12:35

Instrument: ECD7 — Analyzed: 18-May-2018 23:41

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGE0280	Sample Size: 1000 mL
	Prepared: 10-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGE0106	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid	
	Cleanup Batch: CGE0104	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGE0105	Initial Volume: 0.5 mL
	Cleaned: 18-May-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				*29-120 %*	*62.9*	*%*	
Surrogate: Tetrachlorometaxylene				*32-120 %*	*52.0*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*29-120 %*	*61.2*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*32-120 %*	*50.1*	*%*	

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Aroclor PCB - Quality Control

Batch BGE0280 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGE0280-BLK1)				Prepared: 10-May-2018 Analyzed: 18-May-2018 19:36							
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0136			ug/L	*0.0200*		*68.0*	*29-120*			
Surrogate: Tetrachlorometaxylene	0.0108			ug/L	*0.0200*		*53.8*	*32-120*			
Surrogate: Decachlorobiphenyl [2C]	0.0132			ug/L	*0.0200*		*66.2*	*29-120*			
Surrogate: Tetrachlorometaxylene [2C]	0.0106			ug/L	*0.0200*		*52.8*	*32-120*			
LCS (BGE0280-BS1)				Prepared: 10-May-2018 Analyzed: 18-May-2018 19:58							
Aroclor 1016	0.041	0.002	0.010	ug/L	0.0500		82.3	54-120			
Aroclor 1260	0.039	0.003	0.010	ug/L	0.0500		78.9	51-128			
Surrogate: Decachlorobiphenyl	0.0132			ug/L	*0.0200*		*66.2*	*29-120*			
Surrogate: Tetrachlorometaxylene	0.0105			ug/L	*0.0200*		*52.3*	*32-120*			
Surrogate: Decachlorobiphenyl [2C]	0.0130			ug/L	*0.0200*		*65.0*	*29-120*			
Surrogate: Tetrachlorometaxylene [2C]	0.0105			ug/L	*0.0200*		*52.5*	*32-120*			
Matrix Spike (BGE0280-MS1)		**Source: 18E0127-06**		Prepared: 10-May-2018 Analyzed: 18-May-2018 21:28							
Aroclor 1016	0.040	0.002	0.010	ug/L	0.0500	ND	80.0	54-120			
Aroclor 1260	0.032	0.003	0.010	ug/L	0.0500	ND	64.0	51-128			
Surrogate: Decachlorobiphenyl	0.0116			ug/L	*0.0200*		*58.1*	*29-120*			
Surrogate: Tetrachlorometaxylene	0.0104			ug/L	*0.0200*		*51.8*	*32-120*			
Surrogate: Decachlorobiphenyl [2C]	0.0113			ug/L	*0.0200*		*56.4*	*29-120*			
Surrogate: Tetrachlorometaxylene [2C]	0.0103			ug/L	*0.0200*		*51.4*	*32-120*			
Matrix Spike Dup (BGE0280-MSD1)		**Source: 18E0127-06**		Prepared: 10-May-2018 Analyzed: 18-May-2018 21:50							
Aroclor 1016	0.040	0.002	0.010	ug/L	0.0500	ND	80.0	54-120	0.14	30	
Aroclor 1260	0.037	0.003	0.010	ug/L	0.0500	ND	74.0	51-128	13.90	30	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Aroclor PCB - Quality Control

Batch BGE0280 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BGE0280-MSD1)	**Source: 18E0127-06**			Prepared: 10-May-2018 Analyzed: 18-May-2018 21:50							
Surrogate: Decachlorobiphenyl	0.0125			ug/L	*0.0200*		*62.4*	*29-120*			
Surrogate: Tetrachlorometaxylene	0.0105			ug/L	*0.0200*		*52.3*	*32-120*			
Surrogate: Decachlorobiphenyl [2C]	0.0122			ug/L	*0.0200*		*60.9*	*29-120*			
Surrogate: Tetrachlorometaxylene [2C]	0.0103			ug/L	*0.0200*		*51.3*	*32-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Aroclor PCB - Quality Control

Batch BGE0349 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGE0349-BLK1)				Prepared: 14-May-2018 Analyzed: 18-May-2018 13:17							
Aroclor 1016	ND	8.0	20.0	ug/kg							U
Aroclor 1221	ND	8.0	20.0	ug/kg							U
Aroclor 1232	ND	8.0	20.0	ug/kg							U
Aroclor 1242	ND	8.0	20.0	ug/kg							U
Aroclor 1248	ND	8.0	20.0	ug/kg							U
Aroclor 1254	ND	8.0	20.0	ug/kg							U
Aroclor 1260	ND	9.3	20.0	ug/kg							U
Aroclor 1262	ND	9.3	20.0	ug/kg							U
Aroclor 1268	ND	9.3	20.0	ug/kg							U
Surrogate: Decachlorobiphenyl	40.7			ug/kg	*40.0*		*102*	*40-133*			
Surrogate: Tetrachlorometaxylene	42.4			ug/kg	*40.0*		*106*	*53-120*			
Surrogate: Decachlorobiphenyl [2C]	39.2			ug/kg	*40.0*		*98.1*	*40-133*			
Surrogate: Tetrachlorometaxylene [2C]	40.4			ug/kg	*40.0*		*101*	*53-120*			
LCS (BGE0349-BS1)				Prepared: 14-May-2018 Analyzed: 18-May-2018 13:39							
Aroclor 1016	540	8.0	20.0	ug/kg	500		108	52-120			
Aroclor 1260	505	9.3	20.0	ug/kg	500		101	57-120			
Surrogate: Decachlorobiphenyl	39.0			ug/kg	*40.0*		*97.4*	*40-133*			
Surrogate: Tetrachlorometaxylene	41.1			ug/kg	*40.0*		*103*	*53-120*			
Surrogate: Decachlorobiphenyl [2C]	37.7			ug/kg	*40.0*		*94.2*	*40-133*			
Surrogate: Tetrachlorometaxylene [2C]	40.0			ug/kg	*40.0*		*100*	*53-120*			
Matrix Spike (BGE0349-MS1)		**Source: 18E0127-05**		Prepared: 14-May-2018 Analyzed: 18-May-2018 15:53							
Aroclor 1016	549	7.6	18.9	ug/kg	472	ND	116	52-120			
Aroclor 1260	505	8.8	18.9	ug/kg	472	ND	107	57-120			
Surrogate: Decachlorobiphenyl	37.5			ug/kg	*37.8*		*99.2*	*40-133*			
Surrogate: Tetrachlorometaxylene	39.5			ug/kg	*37.8*		*105*	*53-120*			
Surrogate: Decachlorobiphenyl [2C]	36.2			ug/kg	*37.8*		*95.8*	*40-133*			
Surrogate: Tetrachlorometaxylene [2C]	37.8			ug/kg	*37.8*		*100*	*53-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BGE0349-MSD1)		**Source: 18E0127-05**		Prepared: 14-May-2018 Analyzed: 18-May-2018 16:16							
Aroclor 1016	507	7.5	18.8	ug/kg	469	ND	108	52-120	7.98	30	
Aroclor 1260	458	8.7	18.8	ug/kg	469	ND	97.7	57-120	9.71	30	

Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Aroclor PCB - Quality Control

Batch BGE0349 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BGE0349-MSD1)	**Source: 18E0127-05**			Prepared: 14-May-2018 Analyzed: 18-May-2018 16:16							
Surrogate: Decachlorobiphenyl	36.1			ug/kg	*37.5*		*96.3*	*40-133*			
Surrogate: Tetrachlorometaxylene	38.8			ug/kg	*37.5*		*103*	*53-120*			
Surrogate: Decachlorobiphenyl [2C]	35.1			ug/kg	*37.5*		*93.5*	*40-133*			
Surrogate: Tetrachlorometaxylene [2C]	36.2			ug/kg	*37.5*		*96.4*	*53-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Certified Analyses included in this Report

Analyte	Certifications
EPA 8082A in Solid	
Aroclor 1016	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
EPA 8082A in Water	
Aroclor 1016	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC

Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Aroclor 1268	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,CALAP,ADEC

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

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Dalton, Olmsted & Fuglevand, Inc	Project: Boeing Kent Space Center	
1420 - 156th Ave., NE STE C1	Project Number: [none]	**Reported:**
Bellevue WA, 98007	Project Manager: Natasya Gray	22-May-2018 12:43

Notes and Definitions

J	Estimated concentration value detected below the reporting limit.
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.